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FUNCTIONAL FITNESS AND PHYSICAL PERFORMANCE OF FOOTBALL PLAYERS OF VARIOUS AMPUA

ZAKHARYEVA NATALIA*, ALAA ALHAKEEM, MIKHAILOVA ANASTASIA VLADIMIROVNA

Center for Sports Medicine of the Research Institute of Sports and Sports Medicine, Russian State University of Physical Education, Sport, Youth and Tourism (SCOLIPE), MOSCOW.
***Email**: zakharyeva.natalia@mail.ru*

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ABSTRACT

The purpose of this scientific research was to evaluate the criteria of functional fitness and physical performance according to the data of physical, echocardiographic and electrocardiographic studies in highly qualified football players. Participants for this research were 17 regularly trained football players (average age: 18.54±0.9 years; experience in football was 12.46±1.08 years). All athletes regularly train in the Sports Academic Club of the city of Moscow and are members of the national sports team of RSUPE (SCOLIPE). The studies conducted on a voluntary basis, and there are individual consent forms. All tests were performed during the hours of physiological sympathicotonia. It was found out that, the peculiarities of adaptive reactions of the cardiovascular system and the reactions of the analyzer systems (based on psychophysiological testing) of football players of different game specialization. The playing activity of a goalkeeper in football requires the manifestation of specific qualities such as speed and accuracy, defenders and forwards have almost the same anaerobic alactate capabilities. It was also found that the midfielders lag behind defenders and forwards in terms of the development of aerobic physical performance..

Keywords: *Functional fitness, physical performance, football players, AMPUA.*

1. INTRODUCTION

The problems are forming a high level of body's functional capabilities of the body of football players is impossible without a clear view of the structure of functional fitness. To date, various view have been formed on the issue of defining the concept of "functional readiness". From the concept definition of the "function", this is the readiness of the body to perform a certain activity (Danilova, 1985; Lyukshinova, 2006; Pavlichenko, 2015; Platonov, 2004; Ponomareva, 2015; Przybylsky, 2003; Zakharyeva, 2012) defines functional fitness as a 'relatively established state of the body, integrally determined by the level of development of the key functions for this type of sports activity and their specialized properties, which directly or indirectly determine the effectiveness of competitive activity' (Shamardin, 2008).

Fomin (1986) in relation to sports' functional fitness wrote if "as the level of coherence of interaction (mutual interaction) of the four components: mental (perception, attention, operational analysis of the situation, forecasting, choice and decision-making, speed and accuracy of reaction, speed of information processing, other functions of higher nervous activity); neurodynamic (excitability, mobility and stability, tension and stability of

Correspondence: Zakharyeva Natalia (Ph.D.), Professor, Center for Sports Medicine of the Research Institute of Sports and Sports Medicine, Russian State University of Physical Education, Sport, Youth and Tourism (SCOLIPE), MOSCOW, Email: zakharyeva.natalia@mail.ru

autonomic regulation); energy (aerobic and anaerobic performance of the body); motor (strength, speed, flexibility, and coordination abilities (dexterity).

Calculating all the facts, we can point that the functional fitness of athletes have an ability to provide the proper level by the activity of organs, systems and the body that is necessary to perform a specific (sports) muscle (physical) load (work) within the framework of a regulated motor act (movement techniques) (Hoff, 2005; Shamardin, 2009). It is very important for timely consideration of such factors as age, qualification, playing role, training period, which have a significant impact on the level of physical performance (Shpichka, 2016). There is a clear distribution of functions between the players in a football team: goalkeeper, outfield and central defenders, midfield players, outfield and central forwards. This arrangement of team members not only provides better coordination and maneuverability, but also allows you to take into account the individual characteristics of athletes. The football players have a significant impact on the level of special performance, the development of physical qualities: Forwarders - characterized by more advanced speed abilities, in particular speed endurance.That reflects a high level of performance and alactate anaerobic energy supply mechanisms and glycolytic anaerobic capabilities; Goalkeepers also develop high-speed qualities; Midfielders distinguished by high physical performance, aerobic performance; and Defenders characterized by a predominance of aerobic performance and endurance.

The football players, regardless of their role, have a well-developed speed endurance, a high level of anaerobic maintenance, and a state of metabolism. Research by various authors confirm a positive correlation between endurance, physical strength, and performance in high-performance football. The average intensity of a football match is near the anaerobic threshold (80-90% of fcmax). In two consecutive 45-minute continuous matches, it is physiologically impossible to work all the time with an average intensity that significantly exceeds the anaerobic threshold. The full supply of glycogen in the muscles can last about 90 minutes, and its preservation has a significant effect. Athletes are being advised to focus on maximizing their muscle glycogen stores before games and workouts. It was found by the experts that players with a low content of glycogen in the thigh muscles at the beginning of the game go and run in 25% less distance than others. Even more the noticeable difference was reflected in running speed: players with initially low glycogen content covered 50% of the total walking distance and 15% of the sprint, as opposed to 27% of the walk and 24% of the sprint of players with initially high glycogen levels.

The average oxygen consumption level for international football teams is between 55 and 68 ml kg-1 / min-1 and the maximum squat strength is between 120 and 180 kg. These values are similar to the results found in athletes of other team sports. The shock volume of the heart is an element in the oxygen chain that determines aerobic endurance for athletes. More intensive training lead to increase heart volume, which in turn increases maximum oxygen consumption and, consequently, game performance in terms of distance traveled, ball contact, and number of sprints. The training used in experimental studies (Hoff, 2005) consisted of 4×4-minute “intervals” uphill with 90-95% of the maximum heart rate; these intervals alternate with a 3-minute jog at 70% of the maximum heart rate to facilitate lactate withdrawal. The training results (various exercises) with the ball can be as effective as running with the ball. Strength training is considered being effective for changes in strength indicators in terms of the “maximum of one repetition”, as well as for running speed and jumping height in elite and professional football players without any body’s weight changes.

Since there is united acts for the universal testing the strength of football players, it is difficult to compare the results in different studies all over the world. In the authors (Wisløff et al., 2004), show that commonly used isokinetic tests do not show the movements of the limbs that are involved during the game of football. The tests using a barbell, according to the authors of the article, more accurately reflect the functionality of a football player. In

addition, barbells are easily accessible to most clubs and provide an opportunity to develop a working program of functional testing in combination with strength training. Both maximum strength and speed of strength development are important factors for successful competitive performance due to the requirements of the gameplay, so you should systematically work in a weekly schedule using several repetitions at high loads and high bar compression speed.

The influence of physical activity on the body of an athlete - football player is the state of his cardiovascular system. Currently, the state of the cardiovascular system can be assessed by conducting a comprehensive examination of football players: consultations with a cardiologist, electrocardiography, echocardiography, functional tests. Echocardiographic characteristics of football players are considered in the papers of Abernethy, Choo, and Hutter (2003). The fact is that during endurance training, the volume of physical activity is quite high, there are long episodes of high cardiac output-all this increases the size of the left ventricular chamber (LV) with less influence on the wall thickness. A large meta-analysis of Pluim, Zwinderman, van der Laarse, and van der Wall, (2000) confirmed differences in the adaptation of the cardiovascular system to different types of physical activity – static and dynamic. The purpose of this scientific research was to evaluate the criteria of functional fitness and physical performance according to the data of physical, echocardiographic and electrocardiographic studies in highly qualified football players.

2. METHODS AND MATERIALS

2.1 Participants

This scientific research conducted on 17 regularly trained football players (average age: 18.54±0.9 years; playing experience: 12.46±1.08 years). All athletes were regularly train in the Sports Academic Club of the city of Moscow and were the members of the national sports team of RSUPE (SCOLIPE). The educational qualification of these football players were high as 10 had the First adult sports category; 6 were having Master of Sports (KMS). Selected players belonged to the I-II health group, that was, at the time of the physiological experiment, they were practically healthy. The study conducted on a voluntary basis, and there are individual consent forms. All tests were performed during the hours of physiological sympathicotonia.

2.2 Procedure

The study conducted under standardized conditions. Base science experiment served as a laboratory Medical and biological support of sports teams of the Sports medicine Centre, research Institute for Sport and Sports medicine RSUPE (SCOLIPE). The study was conducted from September 2018 to February 2020, during the preparatory and competitive stage of sports training.

The following steps and methods were used in this research:

1. Sociological methods (questionnaires and interviews of athletes and their coaches);
2. The study of the statokinetic stability of football players of various roles was carried out on the domestic device “Stabilan 1-02” produced by Scientific Center “Ritm” Taganrog city. Researcher used a computerized static motor-cognitive test “Target” with biofeedback on the reference reaction (Shestakov, 2007; Kubryak, & Grokhovsky, 2012). The player must keep his balance by deflecting his body in such a way as to hold the marker that displays the position of the center of pressure on the stability platform in the center of the target. The athlete stands on the stability platform without shoes in the American stand position according to Shestakov (2007), i.e. feet shoulder-width apart. The test was conducted in one stage with visual biofeedback (BOS).

3. Psychophysiological testing included testing on the program "Researcher of temporal and spatial properties of a person version 2.1" (Koryagina 2001). The program contains a set of 10 tests for the experimental study of the processes of perception of time and space, psychomotor abilities of a person, the properties of the nervous system, as well as the level of development of the physical quality of dexterity (coordination abilities), which is very important for assessing the functional state of football players (Ilyin, 2005).
4. The assessment of physical performance was carried out by the method of a two-stage test with submaximal load-PWC_{170}.
5. To measure flexibility a test of the slope on the bench was performed.
6. For measuring the strength of the flexor muscles of the hand and fingers a hand dynamometer was used (see, Figure 1.).

Figure 1: Measurement of the maximum arbitrary strength of the hand muscles of a football player

The strength of the extensor muscles of the vertebral column is determined using a Stanovoy dynamometer.

7. The study of the parameters of external respiration was carried out by spirometry using an electronic device − spirometer "Spiro S-100" LLC "Altonika", Moscow. Researcher evaluated the ventilation functions, namely: the measurement and evaluation of the magnitudes of the tidal volume (ml), reserve volume inspiratory - (ml), reserve expiratory volume - (ml); vital capacity of the lungs ml).
8. The study of blood pressure and pulse of football players was carried out with a semi-automatic tonometer manufactured by Omron. The measurements were carried out 2-fold before and after testing (see Figure 2).

Figure 2: Tonometry-measurement of blood pressure and heart rate at rest of a football player; Center for Sports Medicine 2018.

9. Heart rate was measured using a Device-Polar-610.
10. Electrocardiography-ECG recording performed at a tape speed of 50 mm/sec, with a duration of 1 mm of 0.02. When recording the ECG, 12 leads were used (see Figure 3).

Figure 3; Measurement of electrocardiography of a football player by a graduate student in the laboratory of the National Center for Sports Medicine

9. Echocardiography. The players were examined on a domestic device using the method of transthoracic echocardiography (ultrasound scanner Aloka SSD-3500).

3. RESULTS AND DISCUSSION

A survey of the laboratory of Medical and Biological support of RSUPE (SCOLIPE) national football team conducted. Highly qualified 17 football players were examined, with an average age of 18.54±0.9 years; the experience of playing football was 12.46 ±1.08 years. All athletes regularly train in the Sports Academy club of the city of Moscow. Following results have been obtained after statistical analysis of raw data.

Fifteen players suffered by the Acute Respiratory Viral Infections 1-2 times a year, and two players suffered by the Acute Respiratory Viral Infections3-4 times a year. Two athletes, chronic diseases were noted - chronic tonsillitis; one athlete had an allergy.

Football players have a high frequency of injuries of the musculoskeletal system - 56.45% (9 people). In the history of life, the players noted: concussion; a ligament rupture of the ankle joint; tear of the quadriceps muscle of the thigh; a fracture of the fifth metatarsal bone; fracture of the clavicle; the injury to the meniscus of the left foot; heel spurs; torn ligaments on the ankle of both legs.

A one third of the athletes had a surgery treatment due to professional injuries, 2 football players had surgery treatment on for adenoids. One player had a surgery treatment for a curvature of the nasal septum; one person had a surgery treatment about the ventural hernia. According to the sports history of 4th football players (23/53%), their fathers (in the past) were also football players.

The highest achievements in football according to the survey and the conversation were noted by only 3 players: one person (fullback) – the Champion of Russia in the Moscow zone; one person (midfielder) played in the national team of the Moscow region; one person (fullback) was 4 times champion in the Premier League zone − the Moscow zone.

To analyze the results of a scientific physiological experiment, a physiological observation of the team's football players was carried out during physiological testing, training and during 2 games in the competitive and preparatory periods of sports training. As the results of the observation showed, all the players actively performed their functional duties in the team according to their role in full.

When observing the players during the game, each player evaluated for the quality of ***technical and tactical skill*** (TTD) (Table -1).

Table 1: The criteria assessment of the quality of technical and tactical skills of highly qualified football players

The Transfer of the Ball in the Game of Football	Ball Handling by a Football Player	Shots at the Goal of a Football Player
1. short-and medium-distance ball passes performed backwards for less than 30 meters; 2. short and medium distance ball passes performed forward for less than 30m; 3. Passing the ball over a long distance of more than 30 meters; 4. Ball passes made from the flank; 5. The quality of "strokes" when playing football: "successful" and "unsuccessful".	1. keeping the ball and taking the ball from the opponent during playing football; 2. martial arts for the ball by football players when the ball is at the top; 3. fight for the ball from the players in the bottom, when the ball is tied; 4. interception of the ball by football players.	1. shots on goal with his head in the game of football 2. shots on goal kicks in the game of football

Based on the results of physiological observation and evaluation of technical and tactical actions of football players, models of the effectiveness of TTD for each playing role developed. The analysis of technical and tactical actions of players of various roles according to field observations carried out.

The analysis of technical and tactical actions of players of various roles according to field observations (TTD) carried out. According to the data obtained, the results of the games in the preparatory and competitive periods of sports training were analyzed. As the results of physiological observation showed, the team's players perform their playing functions in full. The players of the team were divided according to their roles and active play on their paylines (playing positions): 1. Offensive line players – ***forwards***; 2. Midfield players - ***midfielders***; 3. Players of the back line of defense –***defenders.***

When observing the players during the game, each player was evaluated for the quality of the TTD. The lowest percentage of not accurately performed data was found. The players who are playing in the middle line-midfielders, can show different results due to many factors: - *with internal factors*: broader features of the functional state of midfielders, the development of physical qualities, the degree of expression of technical and tactical skill, the degree of activity of a particular observed game; playing in different phases of the team; a set of individual dynamic stereotypes and the ability to extrapolate motor skills in specific team players; - *with external factors*: stable for the game of football (distribution of the main tactical functions on the game lines) - *with variable factors*: individual possibilities of climate adaptation, the current result of the match, the tasks facing the team (Bayrachny, 2008; Kostyukevich, 2006; Lesenchuk 2005).

According to the 1st diagram, midfielders and secondarily defenders are more successful as mid-and long-range passes, compared to forwards, but this is the result of a single game and there are quite a lot of influencing factors.

The vast majority of world, European and Russian record holders, medalists and finalists of major international competitions with a high height (176-188 cm) have a relatively small body weight (63-78 kg), a large height and weight index (10-20 units), a weakly expressed subcutaneous fat layer.

The players were measured during anthropometric data. The average values of total body size are presented in the Table 2.

Table 2: Comparative characteristics of anthropometric characteristics of highly qualified football players of various playing roles

The role of football players	Total body size				
	Height (cm)	Weight (kg)	Chest circumference (cm)	The difference in the circumference of the chest between a full in-breath and an out-breath (cm)	Leg length (cm)
Defenders	182,34±7,71	76,4±5,45	93,1 ±2,12	7,7 ± 0,9	98,47±1,65
Midfielders	173,9± 5,34	68,2±4,54	90,25 ± 1,18	8,1 ± 0,5	94,31±2,85
Forwards	171,7±6,34	64,1±5,12	84,2 ± 3,21	7,1 ± 0,7	92,15±2,9
Goalkeepers	185,1±7,45	83.1±3,12	98,1 ± 2,76	9,2 ± 0,4	100,75±1,76

According to the Table 2, the best indicators of chest volume and strength are in goalkeepers, there are no significant differences. According to the experts, in the field of football (Russia – Guba, 2010; Shamardin, 2009) functional development of players characterized by indicators lung capacity, respiratory rate, maximum oxygen consumption, character energotrast and heart rate (HR). In the twenty-first century, the assessment of the functional state of football players (as well as other athletes) is not conceivable without transthoracic surgery. Performance indicators of the cardiovascular system were measured using an Omron S1 electronic semi-automatic tonometer. Measured: systolic and diastolic blood pressure and heart rate. The results are in Table 3.

Table 3: Comparative characteristics of the performance indicators of the heart at rest of football players of different roles in the preparatory period of sports training

The role of football players	Heart rate (beats/min.)	Heart rate at rest (b/m) norm for players 19 years old (b/m)	Systolic blood pressure (in mmHg)	Diastolic blood pressure (in mmHg)
Defenders	63,4±10,11	58,5	132,2±14,46	70,6±5,98
Midfielders	62,01±18,51	58,5	128,86±12,68	73,86±5,01
Forwards	52,11±8,91	58,5	136±12,68	74±5,09
Goalkeepers	56,11±9,13	58,5	144±2,83	86±5,66

There are no significant inter-group differences during tonometry and heart rate monitoring. According to experts Guba (2010), with age, the resting heart rate decreases and after 20 years it stabilizes – on average at the level of 64.5 beats/min. In our research, we analyze the heart rate of football players aged 19-20 years; at this age, the heart rate at rest is rarer and is equal to: 58.5 beats/min (Guba, 2010).

The football players of the 1st, 2nd and 3rd groups generally have sports bradycardia at rest, which reflects fitness; the average heart rate of all players is: 58.42 ±5.7 (bpm), which reflects a high degree of fitness. In the national team of RSUPE (SCOLIPE), sports bradycardia was detected in the 3rd group (Forwards) and the 4th group (Goalkeepers). The players of the 1st (Defenders) and 2nd (Midfielders) groups have an average resting heart rate of 62.01±18.51 beats/min, which also reflects high fitness. The data of blood pressure (SBP) at rest differ only in the 4th group (Goalkeepers): 80±5.28 (b/m); SBP–144±2.83 (mmHg); DBP − 86±5.66 (mmHg), which may reflect the individual norm of the body's reaction (Guba, 2010) or overtraining. In the papers, there are data (Guba, 2010) on the change in cardiac volumes when playing football: the minute volume of the heart is up to 15-25 liters at a pressure of 170/65 to 200/50 mmHg. The function and structure of the heart analyzed by the method of transthoracic echocardiography (Aloka SSD-3500 ultrasound scanner). Due to the strong physical exertion in the body of football players, adaptive changes occur, associated with changes in hemodynamic characteristics. According to the experts, Lang et al. (2006),

the authors determined the normative values of the selected studied indicators. The results of the comparative analysis are in Table 4.

Table 4: EchoCG indicators of highly qualified football players with different roles in the preparatory period of sports training

The Indicators of Echocardiography	Football players of various playing roles				
	Defenders	Midfielders	Forwards	Goalkeepers	Norm
Aorta (sm)*	3,27±1,23	3±0,9	2,8±0,7	3,2±1,3	2,0-3,7
Diastolyc diameter (sm)*	5,1±1,3	4,7±0,5	4,7±1,7	5,1±0,9	4,9 -5,9
Systolyc diameter (sm)*	3,5±0,5	2,9±1,2	3,3±1,1	2,6±1,3	2,5-3,8
Diastolyc volume (ml)	124,03±33,28*	103,5±28,92	102,4±25,92*	123,8±32,91	67-155
Systolyc volume (ml)*	51,27±10,19	33,1±9,13	44,1±14,41	24,6±9,61	22-58
Impact volume (ml)*	79,16±20,31	70,4±20,23	85,4±26,41	99,2±27,41	60-80
Heart rate (bpm) according to ECG datum	74±29,41*	62,01±18,51*	52±8,91*	56±9,13*	60-80
Differences between comparison groups	p1> p3; (p<0,05)	p1> p2; (p<0,05)	p1> p3; p2 > p3; (p<0,05)	p1> p4; p2>p4; (p<0,05)	

The results of the echo-cardiographic study indicate the absence of structural morphological pathology of the heart in the examined athletes. The heart rate indicator has significant inter-group differences in the 1st and 3rd comparison groups; the 1st and 2nd comparison groups; the 2nd and 3rd comparison groups; the 1st and 4th comparison groups.

According to ECG data, defensive players in 100% of cases showed signs of a physiological sports heart: - Sinus bradycardia with episodes of supraventricular pacemaker migration -12 football players (70.58 %); Increased QRS voltage in 100% of cases; Early ventricular repolarization syndrome (SRR) in 76% of cases. Researcher found the presence of these indicators on ECG and echocardiography. There are the most significant indicators that characterize the formation of a sports heart (even if they are not deviated from the norm). Physical qualities – innate morphofunctional qualities, thanks to which physical activity of a person is possible, which gets its full manifestation in appropriate motor activity. The main physical qualities include muscle strength, speed, endurance, flexibility and agility. According to Guba (2010), the strength of the torso muscles was 18 years old – 125 kg.

When assessing age-related changes in muscle performance, it is necessary to take into account not only the magnitude of the load, but also its qualitative features (local or general, dynamic or static), as well as energy characteristics (moderate, high, maximum, submaximal power). When predicting the potential capabilities of football players. It is of particular vital to determine the maximum oxygen consumption by the body's tissues and their resistance to oxygen deficiency. According to Shvarts (1977, 1984), these indicators are determined genetically and the share of heritability is: 73-79% or more.

According to the experts the oxygen "ceiling" can be increased by no more than 20-30% in the football, during training. It was found that the highest level of BMD was recorded in 21-22 years and was 3827 ml. The relative value of BMD at this age was 51 ml/kg. Studies of changes in the basic physiological functions of highly qualified football players have shown that during the game 60-80% of the time they work in the mode of 80-100% of the value of the MPC, which places increased demands on their aerobic capabilities. The average amount of oxygen consumption during the game for highly qualified football players ranges from 3.3 to 4.5 l/min. The energy consumption for 90 minutes of the game is 1490-1980 kcal, which corresponds to the work of a very significant power. The results of measuring the physical qualities of the players of the national team**,** Russian State University of Physical Education, Sport, Youth and Tourism (SCOLIPE) are in Table 5.

Table 5: Indicators of physical qualities of highly qualified football players with different roles in the preparatory period of sports training

Positions	Flexibility (centimeter)	Hand dynamometry right hand kg)	Hand dynamometry, left hand (kg)	PWC_{170} absolute values (kgm/min. w.)	Relative values of PWC_{170} (w/ kg)
Defenders	12 ± 5,76	40,8 ± 6,1	41,1 ±7,35	2394, 5± 589,79	31,36 ± 6,92
Midfielders	9,71 ± 4,98	37,86 ± 6,69	37,86 ±7,4	1968,29± 176,16*	27,91±2,59*
Forwards	10,01 ±4,98	31,1 ± 6,65	34,1 ±7,2	1520 ± 136,16*	23,8 ±1,59*
Goalkeepers	5,5 ± 6,36	46,1 ± 7,07	45,1±7,07	2723,45 ± 754,41	33,25 ± 9,26*

The development of the world football at the present times is a fusion of a high level of individual skill of Europeans and a bright South American style (Shestakov, 2020), which determines the need for an in-depth study of the game activity of football players. The modern development of football makes constantly increasing demands on the physical, technical and tactical readiness of players (Guba, 2010). The multi-factor structure of football player training dictates the need to address the assessment of the functional state and functional training of each player of the team and an individual approach to players of various roles. The identification of these features formed the basis of the presented dissertation.

During the preparation period of sports training, the following differences were vital in the results of assessing the functional state, physical qualities and activity of the vegetative systems, depending on the role of the football player. Features of the functional state and functional readiness of football players with different playing roles during the preparatory period of sports training. The features of the functional state and functional readiness of highly qualified football players are vital during the preparatory period of sports training. The results are in Table 6.

Table 6: The features of the functional state and functional readiness of highly qualified football players during the preparatory period of sports training are presented in

Football players	**Features of the functional state and functional readiness of highly qualified football players in the preparatory period**					
	Strength/ weakness of CNSystem conditioned reflexes	Statistical stability test: "Target»	Physical working capacity	The reaction to a simple conditional reflex irritate Whether psychophysiological tests	Vital respiratory volumes and capacities	Echocardiography
Defenders	A strong type of Nervous System	The low score evaluation of the quality movement 65,46%	Physical performance is high in the comparison groups of football players	The reaction to the impact of simple stimuli: light, sound ,moving object is relatively slow in comparison with football players of other groups	Maximum pulmonary ventilation is reduced in comparison with other groups	Bradycardia. The strain of the myocardium; the development of sports heart
Midfielders	Type of nervous system medium-weak	Low result Assessment of the quality movement– 67,94%	Physical performance is average in comparison with other groups of footballers	The weakest reaction among players to the impact of simple stimuli : light, sound ,moving object in the comparison groups	Vital lung capacity for football players rel. reduced (by 789ml)	Bradycardia. Overstrain of the myocardium; development of a sports heart. Extrasystole
Forwards	Type of nervous system medium-weak	Best score on the test Traffic quality rating-87%	Physical performance is the lowest in comparison with other groups of football players	The fastest reaction to the impact of simple stimuli: light, sound, reaction to a moving object among the comparison groups of football players	The lowest values of the vital capacity of the lungs in -3819±505.93 (ml), 1095 ml. lower in compared. with norm. For football players 19-20 years old.	Bradycardia and norm
Goalkeepers	A strong type of Nervous System	The low score evaluation of the quality movement - 60,5%	Physical performance is the highest in comparison with other groups of footballers	The reaction to the impact of complex stimuli is the fastest among the comparison groups of football players	Excellent values of vital capacity of the lungs and maximum pulmonary ventilation	Bradycardia and norm

The Table 6 presented by us allows us to see the strengths and weaknesses in the functional training of football players of various playing roles and to correct and individualize the training process in the preparatory period of sports training, taking into account the data obtained.

Speaking about the differences in functional training players of high qualification, having different roles in the preparatory period of sports training, we can say that the main differences relate to the typological characteristics of the nervous system, the speed and accuracy of motor responses to simple and complex stimuli to evaluate the spatial – temporal characteristics of the Central Nervous system; values maximum oxygen consumption and vital capacity of the lungs; indicators of cardiac hemodynamics according transthoracic echocardiography, statokinetic stability when performing stabilometric tests, indicators of physical performance in a two-step test PWC_{170} with a submaximal load and the values of flexibility (sample tilt on the bench).

4. CONCLUSION

The question of the peculiarities of the various aspects of the preparation of football players of different roles should be constantly in the field of scientific research and practice. In our research, we found out the peculiarities of adaptive reactions of the cardiovascular system and the reactions of the analyzer systems (based on psychophysiological testing) in football players of different game specialization.

The playing activity of a goalkeeper in football requires the manifestation of specific qualities: speed and accuracy of reactions to a moving object, simple and complex sensorimotor reactions, accuracy of dosing muscle forces and great jumping ability (Shamardin, 1999, 2002, & 2008).

It was noted, that the goalkeepers were noticeably superior in terms of the results of complex psychophysiological sensory-motor tests, that reflect the orientation in time space (a test for evaluating segments in time and others), excellent indicators of physical performance, excellent functional reserves of the respiratory system (according to the data of maximum pulmonary ventilation) and the norm for an athlete - football player - echocardiography indicators. This highlights the ability of the team's goalkeeper to react quickly to situations at the gate and have good stamina throughout the match.

Defenders and Forwards have almost the same anaerobic alactate capabilities (Shamardin, 2008). Our study established significant differences between these groups of players. The Defenders have the worst values of reactions to a moving object, to sound and light than in other comparison groups; signs of bradycardia and myocardial overstrain; development of a sports heart; the lowest pulmonary reserve indicators of vital capacity of the lungs. Changes in the functional readiness of Defenders can lead to weak opportunities to resist the opponent, when playing on the back line, to a decrease in motor accuracy.

Changes in functional fitness revealed in Forwards: a quick reaction to simple and complex stimuli, a normal state of the cardiovascular system -the strengths of their functional fitness; however, there are also problems in the form of low aerobic

Physical working capacity and the lowest values of maximum lung ventilation, which will not allow you to spend the entire game smoothly.

As scientific studies have shown, Midfielders lag behind Defenders and Forwards in terms of the development of aerobic physical performance. The reason for the lag lies in the fact that competitive activity requires Midfielders to show a higher level of endurance than players of other roles. It is assumed that the energy abilities of midfielders are "shifted" towards aerobic performance (Kapilewicz, 2012; Kharitonova, 2015; Shamardin, 1999).

As our research has shown, Midfielders do have lower aerobic physical performance compared to Defenders, but higher numbers compared to Forwards.

Their weak points in functional readiness are: the weakest among the players of the team of different playing roles reaction to the impact of simple stimuli: light, sound reaction to a moving object and signs of obvious myocardial overstrain with extrasystoles when examined on echocardiography, which can negatively affect the game.

1. Highly qualified football players with various playing roles in the preparatory period of sports training differ in the typological characteristics of the Central Nervous System, the speed and accuracy of motor reactions to simple and complex stimuli that assess the spatio – temporal characteristics of the human Central Nervous System, the values of Maximum pulmonary ventilation and Vital Capacity of The Lungs; indicators of cardiohemodynamics according to transthoracic echocardiography, statokinetic stability when performing stabilometric tests, indicators of physical performance in the two-stage PWC170 test with submaximal load and the values of flexibility (tilt test on the bench).
2. The evaluation of the quality of technical and tactical skills of players analysis: passing skills, dribbling, shots highest percentage of defects in the preparatory period of sports training are noted in the forwards, with particularly negative effect on the quality of long passes and can be associated with the medium of weak type of nervous system, and the smallest, the results of physical performance in the test PWC170 the players of this role. The best results of technical and tactical skills were in midfielders, which can be associated with broader features of the functional state, the development of physical qualities, a set of individual dynamic stereotypes and the ability to extrapolate motor midfielders of the team.
3. According to the results of the ECG and transthoracic echocardiography, the defensive players showed signs of a physiological sports heart, which is expressed in: increased QRS voltage in 100% of cases; early ventricular repolarization syndrome (SRR) from the lower and lateral walls in 76% of cases; sinus bradycardia with the Wenckebach phenomenon. The athletes-midfielders showed signs of myocardial overstrain. Players Defenders and Midfielders require follow-up with a cardiologist.
4. The RSUPE (SCOLIPE) national football team, regardless of the sports role, must undergo an in-depth examination by a cardiologist once every 6 months with mandatory monitoring of ECG and echocardiography. The cardiologist's attention should be paid much for the players (among other indicators) to the EchoCG indicators: the final diastolic volume (ml) and the thickness of the left ventricular muscle to exclude overtraining and overstrain of the myocardium; in addition, it is necessary to monitor the functional state of the "sports heart" that has already developed in football players.
5. The players-defenders and midfielders according to ECG and echocardiography showed signs of myocardial overstrain, which dictates the need for dynamic monitoring of the cardiologist and ECG, echocardiography 1 time in 6 months in the group of the players.

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