PHYSICAL PREPAREDNESS AND FUNCTIONAL STATUS OF YOUNG PLAYERS IN THE COMPETITION PERIOD

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Annotation. *Purpose*: evaluate physical preparedness and functional status of young players in the competitive period. *Material*: the study involved two groups of players. One group - 18 athletes aged 13 years. The second group - 16 players aged 14-16 years. Athletes performed tests: running 15 m stroke and 15 m, 30 m from the spot. Determines the amount of creatinine in the urine of athletes. *Results*: the evaluation of physical preparedness of young players indicates a decrease in the speed of the players, as evidenced by indicators and creatinine excretion in the urine. Revealed hypertrophy of the left ventricle, systolic blood volume. Functional state of the older age group athletes is somewhat better than the younger players. Analysis of the studied parameters indicates incomplete recovery of the body of young players. *Conclusions*: It is recommended to use the results to correct the training process of young players.
Keywords: young, football, preparedness, functional, creatinine.

Introduction

With organization of juniors' training-competition process it is necessary to consider high intensity of metabolism and age peculiarities of growing child's organism. Relatively low functional level of cardio vascular and respiratory systems of 13-14 years old boys significantly restrict potentials for fulfillment of durable intensive loads by children. Increased excitability and lability of nervous processes in children's age are positive pre-condition for development of quickness but low level of strength restricts speed-power abilities of organism and quickness in actions of cyclic character [1, 10]. With it, modern junior football develops owing to increasing of requirements to all sides of junior football players' fitness [7, 16]. It is known that in process of competition activity organism endures significant by value and time loads, which require maximal mobilization of junior sportsmen's organisms and pet high requirements to their fitness. Indicators of functional condition of junior sportsmen's organism shall be within age norms [5]. That is why scientifically grounded increasing of general and special physical fitness of junior football players, in compliance with their functional potentials, is an important task of training process [2, 7].

In training of junior football players it is very important to develop quickness and it shall be realized in state of organism's optimal workability [3, 4, 7, 9]. Considering the above said it is necessary to pay attention to quickness of separate movements and ability to increase temp of movements in short periods of time without complicating load [14, 16]. In its turn exercises for quickness for children shall be alternated with relaxation exercises, including exercises for quickness [17, 18, 21-23]. For example, in competition period sportsmen endure frequent increasing loads. It forces coaches to reduce scopes of loads during trainings, which are connected with development of endurance and apply loads of speed-power character [19]. That is why requirements to level of general and special physical fitness cause interest of football specialists. As on present time there have been offered many means of evaluation of football players' fitness in competition period, which are widely used both for adult and junior football players. They imply registration of different indicators both of competition and training functioning as well as parameters of functional state of sportsmen's organism [6].

Control over training and competition processes has become very important with it. The purpose of this control is, by V.M. Platonov, optimization of training and competition functioning on the base of objective evaluation of different sides of fitness and functional abilities of the most important human organism's systems [11]. Only in this case it is possible to compare and analyze their values. The results of this analysis permit to work out programs and plans of training or make corrections for their realization [2]. In age of 11-14 years old scope and chemical content of muscular tissues change as well as motion functions and coordination of movements. In this period psycho-physiological functions, connected with quickness and accuracy of movements, intensively form.

Researches has been showed that content of protein *actine* in muscles substantially changes in process of individual trainings. General quantity of creatine is in linear dependence on content of actine in myofibrils. These indicators can be used for observation over progressing of muscular strength and for prognostication of sport achievements in speed-power exercises. It is possible to increase synthesis of contracting proteins in muscles with exercises, which, by bio-mechanical structure, are close to competition loads. Maximal scope of exercises with maximal quickness, strength and power is determined by critical concentration of creatine-phosphate, lower of which it would be impossible to keep maximal quickness of ATP synthesis. It means actually 5-8 repetitions of every exercise. With higher quantity of repetitions local tiredness starts and reduces coordination and power of movements. With it, in working muscles quantity of ATP decreases; glycolysis and lactate increase; intracellular pH level change to acid side, creatinine excretion increases [3, 13].

Alongside with it analysis of publications points at insufficient level of this problem's solution. With its solution it is necessary to consider the fact that rest period after exercises for quickness results in replacement of anaerobic processes by aerobic oxidizing processes and that is one of components of bio-chemical endurance in work.

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That is why with comprehensive training of junior football players they shall have properly developed bio-chemical basis of all physical abilities.

Purpose, tasks of the work, material and methods

The purpose of the work was to evaluate physical fitness and functional condition of junior football players in competition period.

The task of the work is to fulfill analysis of indicators of physical fitness and functional condition of 14-16 years old football players' in competition period.

The methods of the research: analysis and generalization of special scientific literature, testing of physical fitness levels, anthropometrical measurements, spirometry, backbone dynamometry, determination of PWC_{170}, of maximal oxygen consumption (MOC), threshold of anaerobic exchange (TANE), determination of systolic volume of blood (SBV), level of creatinine excretion by Yaffet's methodic, methods of mathematical statistics.

Medical-biological researches were conducted on the base of scientific laboratory of department of bio-chemistry and hygiene of Lvov state university of physical culture.

In the research 2 groups of junior football players of Lvov junior-sport school №4 took part. One group consisted of 18 junior football players of 13 years old age: 2 goalkeepers, 6 backs, 6 halfbacks and 4 forwards. The second group was: football players of 14-16 years old age – 2 goalkeepers, 5 backs, 6 halfbacks and 3 forwards.

Results of the research

Level of physical fitness of junior 13 years old sportsmen was tested by the following indicators: 15 meters run from running, 15 meters, 30 meters from the spot at the beginning and at the end of competition period. Results of these tests are given in table 1.

At the beginning of competition period junior football players ran 15 meters from running in average for 2.08 sec. and at the end of competition period – for 2.06 sec; for test "15 meters run from the spot" they spent 2.46 sec. at the beginning of competition period and 2.49 sec. – at the end. Test 30 meters run from the spot took 4.79 sec. at the beginning of competition period and 4.84 sec. at the end from football players of 13 years old.

Comparing with the beginning, at the end of competition period football palyers of the tested group fulfilled test "15 meters run from running" by 0.02 sec. better; test "15 meters run from the spot" – by 0.03 sec. worse; test "30 meters run from the spot" - by 0.05 sec. worse. Results in quickness of 15 and 30 meters run of junior football players did not improve during competition period and remained on the previous level. We also did not find any confidence of indicators' difference concerning the mentioned tests at the beginning and at the end of competition period.

Results of research of creatinine excretion of 13 years old football players at the beginning and at the end of competition period are given in fig.1. These data point that even at the beginning of competition period before load quantity of creatinine in urina is lower than standard for children of this age and was 0.36 g per 24 hours ($p<0.05$). After football match the quantity of creatinine in urina increases up to 0.54 g/ 24 hours ($p<0.05$).

Table 1.

Dynamic of time of distance 15 and 30 meters covering by 13 years old football players in competition period (sec.)

Nos.	Test	At the beginning of competition period	At the end of competition period	Confidence of indicators' difference
1.	15 meters from running	2.08±0.07	2.06±0.05	p>0.05
2.	15 meters from the spot	2.46±0.05	2.49±0.06	p>0.05
3.	30 meters from the spot	4.79±0.08	4.84±0.07	p>0.05

At the end of competition period (see fig. 1-B) before match level of creatinine was 0.16 g/24 hours that nearly 2 times less than at the beginning of competition period ($p<0.05$).

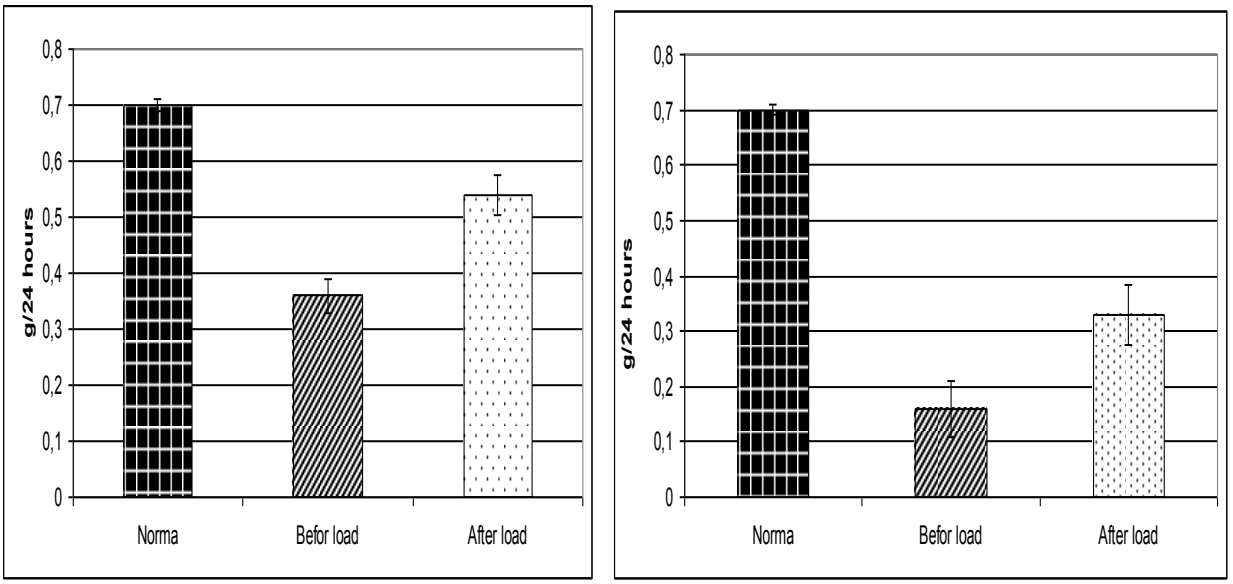

Fig.1. Creatinine excretion of 13 years football players at the beginning (A) and at the end (B) of competition period

After football match quantity of creatinine in urina also increases up to 0.33 g/24 hours ($p<0.05$), but this value still is significantly less than at the beginning of competition period. Analysis of the received data shows that during all competition period quantity of creatinine in urinal is less than it is required by standard. At the beginning of competition period quantity of creatinine before match was lower by 49%, and at the end of competition period it reduced by 77 %. After football match quantity of creatinine in urina was also decreased during competition season: at the beginning of competition period – by 23%, and at the end – by 53%. Thus, the above rendered data of bio-chemical tests point at progressing of tiredness and not complete recreation of junior football players.. Tiredness also is witnessed by absence of positive dynamic in shortening of time of distances 15 and 30 meters' covering at the end of competition period.

In junior football players' training it is necessary to consider their physical condition, functional state, physical fitness [1, 4, 5, 9]. In our researches we determined indicators of physical condition and functional state of 14-16 years old junior football players (see table 2).

Table 2.

Indicators of physical condition and functional state of 14-16 years old junior football players

Nos.	Kinds of fitness	Indicators	Indicators of fitness in different age		
			14 years	15years	16 years
1.	Physical condition	Body mass (kg)	55.9±3.2	55.9±2.8	65.5±2.5
		Height (cm)	165.0±2.3	170.0±3.1	176.0±1.2
		VCL (ml)	3900-4100	4500-4600	4800-5000
		Backbone dynamometry (kg)	100-120	120-140	150-160
2.	Functional state	PWC 170 (kgm/min/kg)	1400-1600	1600-1850	1800-2000
		MOC (ml/kg/min)	50-54	54-56	55-57
		TANE hbr	145-155	155-160	160-170

Physical fitness of this group of junior sportsmen was tested by such tests: control 15, 30 and 60 meters run from the spot and 15 meters from running (for evaluation of quickness), 400 meters run (for evaluation of aerobic-glycolytic endurance), long and triple jumps from the spot and high jumps (evaluation of dynamic force), 3000 meters run or 12 minutes run (evaluation of aerobic endurance) [3]. Integral criterion of football players' fitness was indicators of competition functioning, mean values of which (during season – 16 matches) are given in table 3).

Table 3.

Indicators of special fitness of 14-16 years old football players

Nos.	Kinds of fitness	Indicators, units of measurement	Indicators of fitness in different age		
			14 years	15years	16 years
1.	General physical fitness	15 meters run from the spot, sec.	2.5±0.3	2.4±0.2	2.3±0.2
		15 meters run from running, sec.	2.1±0.2	1.9±0.1	1.8±0.1
		30 meters run sec.	5.0±0.4	4.8±0.2	4.5±0.3
		3x10 run, sec.	8.0±0.4	7.8±0.4	7.6±0.1
		50 meters run, sec.	8.5±0,2	8.2±0.1	8.0±0.1
		7x50 meters run, sec.	71.0±1.2	70.0±0.8	67.0±1.1
		400 meters run, sec.	68.0±1.8	66.0±1.2	65.0±1.4
		12 minutes run	2850.0±43	2900.0±38	3000.0±18
		Long jump from the spot, cm	220.0±8	230.0±5	235.0±6
		Triple jump, cm	610.0±12	640.0±9	650.0±9
		High jump from the spot,	38.0±2.1	40.0±1.8	42.0±1,6
2.	Special physical fitness	Dribbling 30 meters, sec.	5.8±0.12	5.6±0.18	5.3±0.14
		Kicking ball for distance, meters	55.0±4	65.0±5	70.0±1
		Throwing ball for distance, meters	16.0±2	17.0±1	19.0±1
3.	Competition functioning (special physical fitness)	Quantity of tactic-technical actions (TTA):short, middle and long passes, kicking ball, pickups)	50-45	55-50	75-65
		Percentage of mistakes (%)	34-32	34-32	40-35
		Quick movements in match, meters	750-1000	850-1100	900-1200

Alongside with indicators of physical endurance, for determination of football players' readiness for competition functioning indicators of organism's functional state, in particular cardio-vascular system, are rather important [5, 7, 11, 14, 20]. Systemic trainings cause increasing of left ventricle of heart [17]. Haemo-dynamic productivity is also an important indicator of functional state. As per data of some authors systolic volume of blood of junior sportsmen significantly exceeds this indicator of their peers, who are not sportsmen [5]. Adaptation of cardio-vascular system to tensed muscular work is manifested as acceleration of hart functioning (HBR) and noticeable increasing of systolic volume of blood (SBV), especially with progressing of fitness and sport qualification (see table 4). Reduction of SBV in rest state of junior sportsmen, alongside with reduction of HBR, is regarded as indicator of saving influence of trainings [20].

Analysis results of creatinine excretion of 15-16 years old junior football players are given in fig.2. As standard we took excretion of creatinine in control group of 14-16 years old teenagers and it was 1.35 g/l. In training process (preparatory period) this value was 1.2 g/l.

Table 4.

Systolic volume of blood (ml) with significant load on bicycle ergo-meter

Age of the tested	Not sportsmen , X±Sx	Sportsmen, X±Sx
14 years	84.5±8.4	90.7±6.4 (3rd sport degree) 95.4±6.2 (2nd sport degree) 120,2±7,5 (1st sport degree)

At the beginning of competition period creatining excretion in urina was 1.0 g/l before load and after match it increased up to 1.4 g/l. As one can see in fig. 2 at the end of competition period creatinine excretion, in comparison with beginning of competition period, reduced. Before loads, concentration of creatinine was 0.8 g/l and after loads it increased up to 1.2 g/l that is less than at the beginning of competition period.

Quantitative changes of creatinine in football players' urina at the end of competition period point at reduction of energetic resources and are in compliance with reduction of football players' quickness. It is also pointed by the fact that during match energetic resources are replenished at the cost of other energetic systems of organism (may be proteins) and that is why creatinine excretion is low at the end of season.

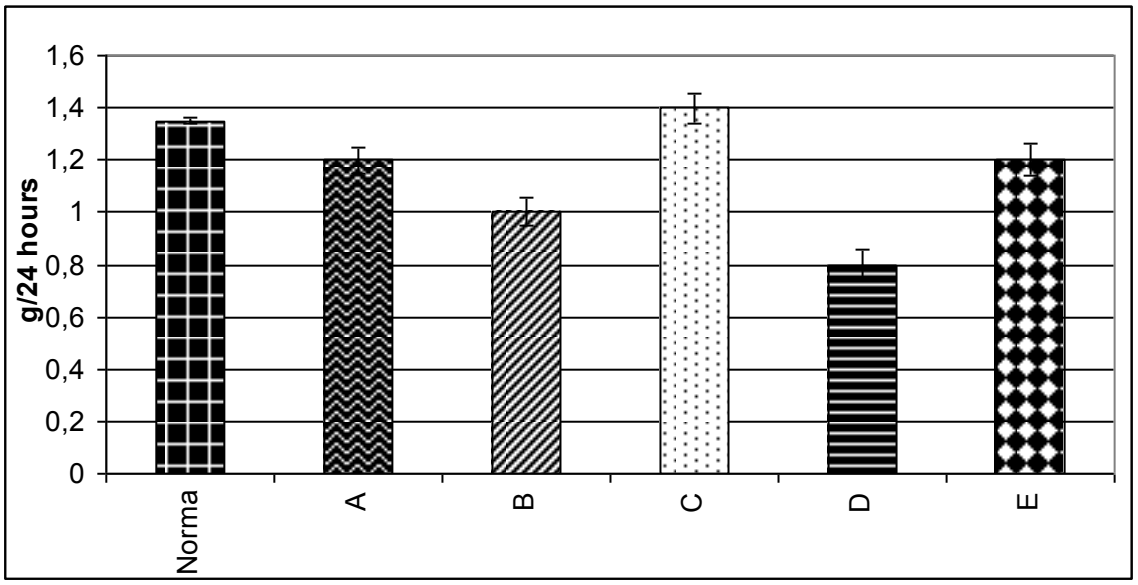

Fig.2. Creatinine excretion of 14-16 years old football players in training and competition periods
A –trainings period, B – beginning of competition period before loads, C – beginning of competition period after loads, D –end of competition period before loads, E –end of competition period after loads.

Conclusions:

1. Results of fulfilled testing on junior football players' physical fitness in competition period permitted to determine their certain reduction of indicators of quickness.
2. The researches showed that response of junior football players' organism to physical loads is manifested as functional changes of cardio-vascular system: increasing of left ventricle, increasing of systolic volume of blood and, besides, we determined dependence of physical fitness on creatinine excretion in urina.
3. Comparison of these indicators in two age groups shows that functional state of older age group is better to some extent than the same of younger group. Analysis of the tested indicators points at incomplete recreation of junior football players' organisms.
4. On the base of analysis of the received results of physical fitness, bio-chemical indicators and functional state of cardio-vascular system, in order to improve sport workability it is possible to make corrections in trainings process.

The prospects of further researches imply correction of training programs and plans on the base of functional state and physical fitness of junior football players. Besides, it is necessary to study energy losses of junior football players in competition period by means of anaerobic-lactate supply.

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