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Keywords

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Authors' Contribution:
A – Study Design
B – Data Collection
C – Statistical Analysis
D – Data Interpretation
E – Manuscript Preparation
F – Literature Search
G – Funds Collection

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Introduction

Successful performance of technical specific actions of basketball players as well as realization of tactical plans of the team depend to a large extent on the functional fitness of athletes, which is determined by the level of aerobic and anaerobic capacities. Insufficient development of aerobic and anaerobic capacities is one of major factors limiting efficient sports activity of basketball players. It was shown that all varieties of estimation methods of functional capabilities in basketball players comes down to different approaches of direct or indirect estimation of maximum oxygen uptake (VO_{2max}) as integral characteristic of aerobic capacities of the body. Besides, there is a significant discord of opinions among researchers concerning the value of VO_{2max} in basketball players of different game position.

As far as aerobic capacities are concerned, sports players occupy intermediate position among elite athletes of different kinds of sport. VO_{2max} average value 4.1 $l{\cdot}min^{-1}$ is significantly lower as compared to athletes who train in cyclic sports events [1]. At the same time, VO_{2max} absolute and relative values registered in athletes, prize-winners of the USSR championship in basketball for elite league, during stepwise 5-min test with ascending pace increased are 5.88 $l{\cdot}min^{-1}$ and 77.4 $ml{\cdot}min^{-1}kg^{-1}$ [2]. A similar level of VO_{2max} (77 $ml{\cdot}min^{-1}kg^{-1}$) is the most characteristic for elite male athletes in cyclic sports events [3]. According to another data, in the dynamics of long-term observations, VO_{2max} values in elite male basketball players of different specialization fluctuated within the limits of 42.3–62.6 $ml{\cdot}min^{-1}kg^{-1}$ depending on the period of athletic preparation [4].

Don MacLaren [1] submitted the level of VO_{2max} in elite male basketball players of different specialization, members of national teams of the USA, the USSR, Brazil and University of Maryland obtained by different investigators. Thus, according to findings, VO_{2max} relative value in centre players (USA professionals) was 41.9 $ml{\cdot}min^{-1}kg^{-1}$, in forwards – 45.9 $ml{\cdot}min^{-1}kg^{-1}$, in guards – 50.0 $ml{\cdot}min^{-1}kg^{-1}$, whereas higher VO_{2max} values were typical of athletes of the team of University of Maryland: centre players – 56.2 $ml{\cdot}min^{-1}kg^{-1}$, forwards – 59.3 $ml{\cdot}min^{-1}kg^{-1}$, guards – 60.6 $ml{\cdot}min^{-1}kg^{-1}$ [5]. In basketball players of the Brazil National team, the following VO_{2max} values were registered: centre players – 59.7 $ml{\cdot}min^{-1}kg^{-1}$, forwards – 59.9 $ml{\cdot}min^{-1}kg^{-1}$, guards – 74.4 $ml{\cdot}min^{-1}kg^{-1}$ [6], whereas in basketball players of the national team of the former USSR, average VO_{2max} value was 55.3 $ml{\cdot}min^{-1}kg^{-1}$ [1]. Such a significant range of fluctuations in VO_{2max} value indicated insufficiently complete characteristics of functional fitness of basketball players during utilization of that index of aerobic power. Among other indices characterizing functional capabilities, arterial pressure, heart rate and blood lactate concentration as well as manifestation of work capacity during performance of jumping tests and running of test segments at different distances are the most frequently used.

According to present conceptions, aerobic capacities of the body cannot be completely estimated with regard for aerobic power only [7]. Thus, the task was set to analyze the features of functional capabilities of the body in elite male basketball players of different specialization and approve the complex of estimation methods of functional fitness which is the most informative in cyclic sports events by means of modern approaches and estimation methods of aerobic capacity structure [8].

Material and Methods

Twenty nine elite international level male basketball players (from high league of Ukraine; 13 athletes were from the national team) were examined during the competitive period of training. Characteristics of the subjects are presented in Table 1.

Tab. 1. Height and body mass of elite male basketball players of different game positions (Mean and SD)

Position	Height, cm	Body mass, kg
Guards	192.6±3.2	89.4±5.2
Forwards	202.4±5.8	93.9±2.6
Centers	210.5±4.1	103.0±5.5

For the analysis of the cardiorespiratory system (CRS) responses to physical loads the complex of the testing exercises was used, allowing estimating aerobic and anaerobic capacities of a sportsman: “standard” work – loads of the average aerobic power ($Wst=2\ Watt \cdot kg^{-1}$); 15 s – loads of maximal anaerobic power characterize anaerobic alactate potential (W15max); 60 s – loads of submaximal anaerobic power characterize anaerobic glycolytic potential (W60max); loads of graded exersise stress test is characterizing of aerobic potential of energy supply (Wcr – power at VO_{2max}); loads of “critical” power.

During testing, breath-by-breath gas exchange data ("Oxycon Pro", Jaeger), acid-base balance of blood (“micro-Astrup”, Dr Lange LP 400) and heart rate (Polar Electro Inc.) for maximum and standard physical loads were continuously obtained. Treadmill LE200CE (Jaeger, Germany) and Monark824E cycle ergometer (“Monark”, Sweden) were used during this study.

For analysis, the following generalized physiological features which define the dynamics of functional fitness were selected: the power of systems (functional and energy), stability (functional and metabolic), the mobility of systems reflecting the development rate of functional and metabolic responses as well as economy (functional and energy) and the degree of realization of functional potentiality of the body under specific conditions of maximum-intensity work [8].

The estimation of results was based on motor manifestations of work capacity, on shifts in physiological and biochemical indices. The method of parallel forms, when three, four or more indices characterize one aspect in the functional fitness of an athlete, was used to promote reliability of the studies. The index complex which significantly reflected the level of functional fitness in the body of athletes was determined.

1. Load power relative body mass (W, $Watt \cdot kg^{-1}$).
2. The value of maximum oxygen uptake (VO_{2max}, $ml \cdot min^{-1}$, $ml \cdot kg^{-1} min^{-1}$) was registered during performance of loads of graded exercise stress test and load of “critical” power until refusal.
3. Oxygen pulse (O_2-HR, $ml \cdot beats^{-1}$) was determined as the ratio VO_2 to HR at that moment: $O_2\text{-}HR = VO_2 \cdot HR^{-1}$.
4. HR functional range (HR FR, %) – as the ratio of maximal HR (HR max, $beats \cdot min^{-1}$) under the load to minimal HR (HR min, $beats \cdot min^{-1}$) at rest in the morning:

$$HR\ FR = (HR\ max \cdot HR\ min^{-1}) \cdot 100\%$$

5. Chronotropic myocardial reserve (CMR) – product of maximal systolic blood pressure under load ($BP\ sys_{max}$, mmHg) and maximal HR (HR max, $beats \cdot min^{-1}$):

$$CMR = (BP\ sys_{max} \cdot HR\ max) \cdot 100^{-1}.$$

6. Total work during maintenance of load of “critical” power until refusal with relative body mass (TCW, $Watt \cdot min \cdot kg^{-1}$): $TCW = W \cdot t \cdot P^{-1}$,

where W – power of “critical” work, Watt; t – time of its maintenance, min; P – body mass, kg.

7. Functional stability factor according to HR (HR drift) at standard work (HR FSF, %):

$$HR\ FSF = (a - b) \cdot c^{-1} \cdot 100\%,$$

where a - HR averaged from 10^{th} to 12^{th} min of loads, min^{-1}; b - HR averaged from 2^{nd} to 4^{th} min of loads, min^{-1}, c - HR averaged from 1^{st} to 12^{th} min of loads, min^{-1}.

8. Functional stability factor according to ventilatory equivalent for O_2 uptake at "standard" work (EQO_2 FSF, %) - similar to HR FSF of "standard" work but for EQO_2.

9. Speed of VO_2 increase (VO_2-speed, arbitrary units) during performance of 60 sec loads of submaximal power: $VO_2\ speed = VO_{2(1''-30'')} \cdot VO_{2(initial)}^{-1}$,

where $VO_{2(1''-30'')}$ - VO_2 value during the 1^{st} 30 s of loads ($ml \cdot min^{-1}$), $VO_{2(initial)}$ - VO_2 value registered before performance of the loads ($ml \cdot min^{-1}$).

10. Half-period responses to HR, time constant ($T_{50}HR$, s).

11. Dependence of the degree of VO_2 increase on the degree of HR increase relative body weight ($l \cdot beats^{-1} kg^{-1}$) was determined according to the results of performance of loads of graded exercise stress test and calculated by the graph on the segment of linear increase in dependence of indices: $\Delta VO_2 \cdot \Delta HR^{-1}$.

12. "Watt-pulse" ($Watt \cdot beats^{-1}$) of "standard" work ($2\ Watt \cdot kg^{-1}$):

$$Watt - HR = W_{st} \cdot HR_{st}^{-1},$$

where W_{st} - power of "standard" work, Watt; HR_{st} - average HR during performance of "standard" work, $beats \cdot min^{-1}$.

13. Realization of the aerobic potential of the body during performance of 60 sec loads of submaximal power (RAP-60s, %):

$$RAP\text{-}60s = VO_{2(average\ for\ 60\ s)} \cdot VO_{2max}^{-1} \cdot 100\%,$$

where $VO_{2(average\ for\ 60\ s)}$ - VO_2 average value during performance of 60 sec loads of submaximal power, $ml \cdot min^{-1} kg^{-1}$.

14. Realization of total aerobic potential (RTAP, %):

$$RTAP = VO_{2max(real)} \cdot VO_{2max(model)}^{-1} \cdot 100\%,$$

where $VO_{2max(real)}$ - VO_{2max} value registered during test-loads, $ml \cdot min^{-1} kg^{-1}$; $VO_{2max(model)}$ for elite athletes ($ml \cdot min^{-1} kg^{-1}$) was determined by a formula proposed earlier (8.):

$$VO_{2max(model)} = 71.8 + (76.2 - P) \cdot 0.49,$$ where P - body mass of an athlete, kg.

Integral estimation of specific functional fitness features (factors) of athletes was conducted in accordance with criteria proposed by V. Mishchenko [8] with estimation of formalized numerical grade. The degree of factor development was determined according to the total sum of numerical indices characterizing the given factor. A relative degree of factor development was determined as percentage of the factor contribution to the total relative estimation of the functional fitness level.

Results

The values characterizing aerobic power of the body in male basketball players of different game position are presented in Table 2.

The highest values of O_2 maximum consumption (VO_{2max} 50.35 $ml \cdot min^{-1} kg^{-1}$), oxygen pulse ($O_2$-HR 27.47 $ml \cdot beats^{-1}$) and power of "critical" work (W_{cr} 3.42 $Watt \cdot kg^{-1}$) were registered in guards. The highest values of lung ventilation ($V_{E(peak)}$ 157.09 $l \cdot min^{-1}$ and 1.67 $l \cdot min^{-1} kg^{-1}$), HR functional range (302.85 %) and chronotropic myocardial reserve (367.86 %) were observed in forwards. The lowest values in aerobic power indices were observed in centres. Significant differences in the values of W_{cr}, $V_{E(peak)}$ relative body mass and chronotropic myocardial reserve were revealed in basketball players of different specialization.

Tab. 2. Characteristics of respiratory system power according to maximum level of aerobic power values in elite male basketball players (Mean and SD)

Indices	Group of athletes			P (t-test) <0.05
	Guards (1)	Forwards (2)	Centers (3)	
Wcr, Watts·kg^{-1}	3.42±0.24	2.82±0.09	3.05±0.13	1-2.3;2-3
VO_2max, ml·min^{-1}	4480.2±187.5	4613.6±118.5	4410.8±125.9	
VO_2max, ml·min^{-1}·kg^{-1}	50.35±4.96	47.86±3.74	45.11±3.93	
$V_E$max (peak), l·min^{-1}·kg^{-1}	140.38±11.06	157.09±13.68	146.92±10.94	
$V_E$max (peak), l·min^{-1}·kg^{-1}	1.52±0.12	1.69±0.14	1.41±0.13	2-3
VO_{2max}/HR, ml·beats^{-1}	27.47±3.51	25.86±4.06	24.23±3.27	
(HRmax·HRmin^{-1})·100^{-1},%	279.39±26.58	302.85±35.83	267.73±21.05	
($BPsys_{max}$·HR_{max})·100^{-1}	325.85±6.04	367.86±24.97	312.62±6.03	1-2.3;2-3

The results of anaerobic character tests (15-s and 60-s maximum test-loads) are presented in Table 3.

Tab. 3. Anaerobic power characteristic of elite male basketball players of different game position (Mean and SD)

Indices	Group of athletes			P (t-test) <0.05
	Guards (1)	Forwards (2)	Centers (3)	
W 15s max, Watts·kg^{-1}	7.71±0.04	7.83±0.07	7.52±0.08	1-2.3;2-3
W 60s max, Watts·kg^{-1}	5.76±0.11	5.56±0.09	5.15±0.18	1-2.3;2-3
pHmin 60 s max load	7.23±0.05	7.18±0.02	7.25±0.04	
La_{max} 60s max load, mmol·l^{-1}	9.81±0.93	10.52±1.31	8.92±0.69	
$PaCO_2$ 60s max load, mmHg	38.80±1.14	39.36±1.59	37.51±1.16	

In basketball players of different specialization, significant differences in the values of alactate and lactate power were revealed. The lowest values of these indices were observed in centres (W15max 6.52 Watt·kg^{-1} and W60max 5.15 Watt·kg^{-1}). The highest value of alactate power was observed in guards (W15max 7.81 Watt·kg^{-1}), whereas in forwards, that of lactate power (W60max 5.75 Watt·kg^{-1}). The most significant acidosis shifts during the performance of 60 sec loads of submaximal power could be observed in guards but no reliability of differences for the given group of indices in basketball players of different specialization was revealed.

During an analysis of the values characterizing the stability of functional responses (Table 4), reliable differences in basketball players with reference to the total work of “critical” power (TCW) relatively to the body mass were revealed – guards 14.98 Watt·min^{-1}kg^{-1}, forwards 13.48 Watt·min^{-1}kg^{-1}, centres 14.06 Watt·min^{-1}kg^{-1}, and by EQO_2 “drift” (EQO_2 FSF) of “standard” work – guards 6,34%, forwards 11.94%, centres 4.68%. The level of functional response stability in HR “drift” (HR FSF) of “standard” work was higher in centres (5.81%) and guards (5.95%).

Tab. 4. The characteristics of functional stability of elite male basketball players (Mean and SD)

Indices	Groups of athletes			P (t-test) <0.05
	Guards (1)	Forwards (2)	Centers (3)	
TCW, $Watt \cdot min \cdot kg^{-1}$	14.98±0.46	13.58±0.31	14.06±0.24	1-2.3;2-3
HR FSF "standard" work (2 $Watt \cdot kg^{-1}$), %	5.95±0.44	6.91±0.69	5.81±0.38	2-3
EQO_2 FSF "standard" work (2 $Watt \cdot kg^{-1}$), %	6.34±1.06	11.94±2.99	4.68±0.59	1-2.3;2-3
HR FSF at "critical" power, %	6.46±1.21	5.41±1.52	6.31±1.19	
pH_{min} at "critical" power, %	7.25±0.03	7.24±0.03	7.27±0.02	

The data characterizing the mobility of functional systems are presented in Table 5.

Tab. 5. The characteristics of capacity for fast kinetics response (functional and metabolic mobility), in elite male basketball players at different game positions, (Mean and SD)

Indices	Group of athletes			P (t-test) <0.05
	Guards (1)	Forwards (2)	Centers (3)	
VO_2 speed of increase at 60-s max load	2.75±0.97	4.26±1.04	2.50±0.38	2-1.3
$T_{50}HRst$ "standard" work (2 $Watt \cdot kg^{-1}$), s	19.44±1.09	18.39±1.59	20.12±1.26	
$T_{50}HR$ 60-s max. load, s	6.89±0.38	5.93±0.51	10.84±1.04	1-2.3; 2-3
$T_{50}HR$ recovery up to HR 120 $beats \cdot min^{-1}$ after load of critical power, s	3.21±0.49	4.51±1.03	2.08±0.86	2-3

The highest rate of VO_2 increase was observed in forwards – 4.26 arbitrary units, the lowest one – in centres – 2.50 arbitrary units. Guards occupied intermediate position – 2.75 arbitrary units. The results of half-period responses to HR ($T_{50}HR$) during "standard" work and 60-sec loads of submaximal power were better in forwards ($T_{50}HRst$ 18.39 s and $T_{50}HR_{60s}$ 5.93 s) than in guards ($T_{50}HRst$ 19.44 s and $T_{50}HR_{60s}$ 6.89 s) and centres ($T_{50}HRst$ 20.12 s and $T_{50}HR_{60s}$ 10.84 s), however HR recovery time up to 120 $beats \cdot min^{-1}$ in forwards (4.51 min) exceeded that in guards (3.23 min) and centres (2.08 min). The reliability of differences in the rate of VO_2 and $T_{50}HR$ increase for 60 sec loads of submaximal power was revealed.

The values characterizing the economy of functional systems are presented in Tab. 6.

Tab. 6. The functional and metabolic economy of elite male basketball players (Mean and SD)

Indices	Groups of athletes	P (t-test) <0.05

	Guards (1)	Forwards (2)	Centers (3)	
W_{AT}, Watt·kg^{-1}	2.84±0.24	2.44±0.38	2.56±0.21	
Mechanical efficiency of “standard” work (2 Watt·kg^{-1}), %	40.43±2.33	21.25±3.05	38.77±1.96	2-1.3
Watt-pulse, Watt·beats^{-1}	1.54±0.12	1.28±0.26	1.54±0.15	
$\Delta VO_2 \cdot \Delta HR^{-1}$,ml·beats^{-1}kg^{-1}	0.54±0.03	0.35±0.06	0.48±0.03	1-2.3; 2-3
EQO_2 “standard” work	26.41±1.23	28.71±1.49	24.50±1.30	2-3
VO_{2AT} % of VO_{2max}, %	51.81±2.07	48.62±2.46	52.50±2.19	

The beginning of the anaerobic threshold is significantly delayed in guards (VO_{2AT} 51.81% of VO_{2max}) and centres (VO_{2AT} 52.5% of VO_{2max}) as compared to forwards (VO_{2AT} 48.62% of VO_{2max}). A significantly higher level of physical work capacity at level of anaerobic transition is observed in guards (W_{AT} 2.84 Watt·kg^{-1}) and the lowest level – in forwards (W_{AT} 2.44 Watt·kg^{-1}). Reliable differences in mechanical efficiency of standard work (guards 40.43%, forwards 21.52%, centres 38.72%) and in $\Delta VO_2 \cdot \Delta HR^{-1}$ of work steps (guards 0.54 ml·beats^{-1}kg^{-1}, forwards 0.35 ml·beats^{-1}kg^{-1}, centres 0,48 ml·beats^{-1}kg^{-1}) should be noted.

Reliable differences in the realization of the total aerobic potential in the body of basketball players of different specialization have not been revealed. The average realization of total aerobic potential within the group is 76.59% (Table 7). Reliable differences in the realization of the aerobic potential during the performance of 60 sec loads of submaximal power have been revealed in guards – 75.10%, forwards – 79.81%, centres – 70.23%.

Tab. 7. The characteristics of aerobic potential realization of elite male basketball players (Mean and SD)

Characteristics	Groups of athletes			P (t-test) <0.05
	Guards (1)	Forwards (2)	Centers (3)	
Realization of aerobic potential during of 60-s max. load,%	75.14±2.37	79.81±3.04	70.23±2.18	1-2.3; 2-3
Realization of total aerobic potential,%	77.10±2.85	75.78±3.48	76.89±2.57	

The results of the formalized estimation of the functional fitness level of the body and development degree for each factor in basketball players of different specialization are presented in Table 8. Besides, as the results of research show, an equally high level of functional fitness in elite male basketball players is provided in each individual case by means of a different combination of structural factors of functional fitness.

Tab. 8. The component characteristics of specific functional fitness (SFF) (formalized estimation) in basketball players of different game positions (Mean and SD)

Components of SFF	Groups of athletes			P (t-test) <0.05
	Guards (1)	Forwards (2)	Centers (3)	
Aerobic power, %	49.42±2.47	47.06±2.08	45.18±1.96	
Anaerobic power, %	35.86±2.11	37.68±2.46	30.58±2.07	3-1.2
Stability, %	38.99±1.97	33.03±3.86	40.17±2.58	2-1.3
Mobility,%	49.53±3.14	55.86±1.79	43.04±3.63	1-2.3;2-3
Economy, %	46.93±3.06	39.95±3.69	45.22±2.51	2-1.3
Realization of aerobic potential, %	14.35±2.59	12.04±3.07	12.45±2.59	
Formalized estimation of summarized level of SFF	235.08±10.35	225.57±13.58	220.59±9.63	

Discussion

The obtained data demonstrate that the game position of high level basketball players was related to working capacity in tests as well as to maximum levels of gas exchange values, lung ventilation, blood circulation and shifts in respiratory homeostasis. VO_{2max} values registered during the complex examination of functional capabilities of the body in male basketball players of different game functions (guards – 50.35 $ml \cdot min^{-1}kg^{-1}$, forwards – 47.86 $ml \cdot min^{-1}kg^{-1}$, centres – 45.11 $ml \cdot min^{-1}kg^{-1}$) correspond the most to the data obtained in studies on USA professionals (guards – 50.0 $ml \cdot min^{-1}kg^{-1}$, forwards – 45.9 $ml \cdot min^{-1}kg^{-1}$, centres – 41.9 $ml \cdot min^{-1}kg^{-1}$) and in our studies make up 77.10% of the realization for total the aerobic potential in guards, 75.78% – in forwards and 76.89% – in centres. The similar values were obtained in some other studies [1, 5, 6].

An analysis of work capacity manifestation in athletes and the dynamics of physiological characteristics during the implementation of the testing program as well as a formalized estimation of the degree of development of functional fitness factors in the body determine functional capability features in basketball players of different game positions (Table 8). It is impossible to compare these data with results of other studies, since such an integrated analysis of physiological characteristics and functional fitness in high level basketball players had not been provided earlier.

The highest level of functional fitness has been demonstrated by guards (235.08 arbitrary units) and the lowest level – by centres (217.59 arbitrary units), whereas forwards occupy intermediate position (225.57 arbitrary units), which corresponds to the data obtained by other investigators [5, 6, 8].

Guards are notable for a higher degree in development factors of aerobic power (49.42), economy (46.93) and the realization of aerobic potential of the body (14.35). As compared to forwards, a lower degree in development factors of anaerobic power (35.86) and mobility (49.53) is observed in guards. Besides, in guards, a lower degree of the development factor of stability (38.99) is observed as compared to centres. A comparison of anaerobic power indices in guards and forwards (Table 3) demonstrates that the indices of lactate power are higher in guards (guards – W60max 5.76 $Watt \cdot kg^{-1}$, forwards – W60max 5.56 $Watt \cdot kg^{-1}$), whereas the indices of alactate power are higher in forwards (forwards – W15max 7.81 Watt·kg^{-1}, guards – W15max 7.70 Watt·kg^{-1}). Thus, due to a high level of functional capabilities, the guards, to a greater degree, are predisposed to endurance work which demands a manifestation of aerobic power, economy and capacity for more complete realization of the aerobic potential of the body. Guards demonstrate a high level of speed endurance which demands a manifestation of anaerobic lactate mechanisms of energy supply.

For guards, the highest degree in the development of factors of anaerobic power (37.68) and mobility (55.86), and a low degree in the development of factors of stability (33.02) and economy (39.95) are characteristic as compared to guards and centres. The development degree of aerobic power in forwards is slightly lower than in guards. It should be noted that in forwards the lower level of VO_{2max} as compared to guards combines with the highest values of other indices characterizing aerobic power – maximum lung ventilation, HR functional range, chronotropic myocardial reserve (Table 2). Obviously, forwards are able to achieve a high level of metabolism and function of functional systems more quickly than it takes place in some other sports [9]. But forwards cannot maintain the achieved functioning level for prolonged time; therefore, the periods of high-intensity work should be alternated most frequently with the periods of recovery. An analysis of anaerobic capabilities of the body in basketball players demonstrates that forwards are most predisposed to work of speed-strength character, which demands a manifestation of anaerobic alactate power of the body.

In centres, the highest degree in the development of stability factor (40.17) and a low degree in the development of factors of anaerobic power (30.58) and mobility (43.04) are observed as well as an average degree in development of factors of economy (45.22) and realization of aerobic potential of the body (12.40). Centres are predisposed to work of aerobic character. Centres achieve relatively low levels of energy supply of the body (as compared to guards and forwards), but they are able to maintain the achieved level for prolonged time. One may suppose that limited aerobic capabilities of the body in centres do not provide prerequisites for the development of other aspects in energy supply, in particular anaerobic lactate capacities. Thus, the playing activity of centres is less significantly satiated with speed actions, which demand a manifestation of anaerobic lactate capacities of the body.

The character of preparation aimed at the improvement of functional capabilities in basketball players as well as tactical plans of the team should, in many aspects, be determined by the features in the structure of athletes' functional fitness. The team having no equal line-up is compelled to use the same players for the greater part of playing time which determines the overwhelming demand for provision of their work capacity at the expense of aerobic capacities of the body, economical functioning of functional systems and realization of the aerobic potential of the body.

In teams having an equal line-up which allows using all players during the match, for players entering the game in specific conditions, an ability to achieve a high level of functioning for a short time assumes a great significance – a development rate of functional and metabolic responses as well as anaerobic lactate capacities of the body which provides a high intensity of action by players, especially in case of sudden substitution when the players enter the game without preliminary warm-up. In such teams, the character of preparation dictates a selection of tactical means (prolonged pressing, deep break, sudden pressing at the end of the match, etc.).

Conclusion

The description of the structure of aerobic capacities and components of functional features in basketball players of different game positions allows determining the most optimal character of playing activity of athletes as well as individualizing the training process. It may be based on account of the level and specific weight of components (factors) functional fitness capacities in players of different game positions.

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