Original Article

Research on the reactivity / adaptation of players to the specific effort in performance football

CHIRIAC PAUL BOGDAN¹, MIHĂILESCU LILIANA²

^{1,2} University of Pitesti, ROMANIA

Published online: November 30, 2019

(Accepted for publication: November 15, 2019)

DOI:10.7752/jpes.2019.s6312

Abstract

Performance football is playing with increasing intensity and that is why the purpose of the research was to check a system for evaluating the individual characteristics of the reactivity level / adapting the players to the specific effort, on the team positions, to optimize the preparation and recovery.

We considered that we can identify techniques and instruments, devices and research facilities by using which can be made a diagnosis of the level of reaction and adaptation of football players, specialized in different positions, players involved in the national league's competitive system, to the specific effort in training and competitions.

In order to verify the hypothesis and achieve the purpose of the research, we conducted a pilot study with the C.S. Internațional Bălești team, the third league, in 2017, in the second period of preparation and competition, we selected and used the following tools for objective evaluation of the spectra circumscribed to the theme: Polar system, heart rate, load level, calories burned, lactate GPS data, to determine the level of lactic acid in the blood, the Gacon test to evaluate the aerobic power of the subjects (VO₂ Max) and a motor test to determine the lactacid speed capacity.

Based on the sports diagnosis made at the beginning of the pilot study with the instruments / tests used, the specific effort was directed in the preparatory, precompetitive and competitive stages of the players, on playing positions, with the application of the principle of individualization and at the end of the research I found, based on the same evaluation tools, improvement of time at the lactacid speed test due to the power training preceded by the maximum force weekly, which led to increases in start, acceleration and deceleration power; significant improvement of lactic acid tolerance, due to weekly lactacid speed training, but also improved number of repetitions and implicitly aerobic power, in the Gacon test, as a result of weekly VO₂ Max development training.

Keywords: football, effort, reactivity, adaptation

Introduction

Our research was carried out on the basis of some premises, ideas that came from the documentation we have made.

During the preparatory period "the main objective is to form the basis of the sportsman's training, by inducing physiological, psychological and technical adaptations" (Bompa, T., 2009, p. 148). During the preparatory period, especially in the first part, the emphasis is on the development of basic physical training, through the use of large loads.

These large loads can be reached by increasing the training volume, while decreasing its intensity. (Bompa, T., 2009, p. 88). Physiological systems must be progressively overloaded to induce the necessary adaptations to improve performance. The high volumes of resistance exercises performed at low intensity do not seem to significantly stimulate the corresponding physiological performance or adaptations. (Laursen, Jenkins, 2002, p. 56)

The pre-competition period serves as a method of training athletes for future competitions by participating in unofficial or friendly competitions, which can provide positive feedback on the level of preparation of the athlete and his ability to participate in official competitions. (Bompa, T., 2009, p. 153).

During this period, if he continues to undergo a large volume of training, his physical condition will improve, but he will not register efficiency improvements. According to the same author, the performance increase is obtained by decreasing the volume and increasing the intensity (Bompa, T., 2009, p. 88)

The competition period is intended for participation in official competitions. From the point of view of the effort the specialist of the field considers that "during the game, the maximum intensity is used in only 10% of the distance traveled by players, for sprinting", (Rădulescu, M., 2009, p. 37) and "the highest heart rate and lactate concentration values are recorded during the championship matches". (Eniseler, 2005, p. 799).

Methodological approach to research

The purpose of the research was to verify a system for evaluating the individual characteristics of the reactivity level / adapting the players, on the team positions, to optimize the specific training and recovery.

Working hypotheses

Knowing the characteristics of the specific effort of the football players, on playing stations, determines the appropriate contents of their specific training programs.

The objective determination of the body's reactivity to different types of effort, during the different preparation periods of the annual macrocycle, facilitates the sports diagnosis. This represents the objective basis of rethinking and restructuring individualized training, by playing positions.

In the research, several *instruments / apparatus, measuring and evaluation tests* were used: the Polar system, for determining the heart rate, the loading level, the calories burned; dairy machine, for determining the level of lactic acid in the blood; Gacon test to evaluate aerobic power (VO_2 Max) and a motor test to determine the speed of lactacid speed - running for a total distance of 60 meters on a specific route (3 milestones are placed at a distance of 10 meters each and leave in run at maximum speed from the middle milestone. Run 10 meters to the second milestone, touch the palm, turn 20 meters to the third milestone and touch, return to the second milestone, touch it and then return to the milestone from which you left.

Results and discussion

The research was carried out at C.S. Internațional Bălești team, consisting of 18 players, aged between 19-37 years, during the period 10.07-21.11.2017.

At the beginning of the research the subjects were evaluated on the basis of the previously presented evidence. For the analysis and interpretation of the results we considered the referrals of the Gacon test, the software of the dairy machine, for the lactacid effort test, the referentials proposed and validated by two physical trainers (Dumitru Vasilică, FCU Craiova 1948 and Coc Sergiu Raul, CFR Cluj 2). In the following table the results of the players (less goalkeepers) at the two evaluation tests at the initial testing - July 2017 are presented. Tabel 1. Results and interpretation of the indicators of the initial testing

No	Sub.	Position in game	The Gacon test			Lactacid speed test			
			No rep.	VO_2 Max	Interpretation	No rep.	Time (sec)	Lactic acid mm/l	Interpretation
1.	O. A.	Goalkeeper	-	-	-	-	-	-	-
2.	J. O.	Goalkeeper	-	-	-	-	-	-	-
3.	N. C.	Side defender	21	60	good aerobic power	6	12.59	13.3	Poor time, no power, small number of repetitions, at a concentration of 13.6 mm / l stopped. It does not tolerate high concentrations of lactic acid
4.	I.N.	Central defender	18	56	good aerobic power	6	12.00	21.6	Low time, no power, small number of repetitions, a concentration of 21.6 mm / l shows that he has the ability to work on a high concentration if he has a specific training program
5.	B. D.	Central defender	18	56	good aerobic power	6	12.18	23.7	Low time, low power, small number of repetitions, lactic acid concentration denotes a high tolerance capacity for this type of effort
6.	L. L.	Central defender	19	57	good aerobic power	6	11.57	19.7	Low time, low power, small number of repetitions, lactic acid concentration denotes a high tolerance capacity for this type of effort
7.	A. M.	Side defender	20	59	satisfactory aerobic power	6	12.18	24.3	Low time, low power, small number of repetitions, lactic acid concentration denotes a high tolerance capacity for this type of effort

8.	F.R.	Side defender	18	56	low aerobic power at the defender	6	11.57	13.8	Satisfactory time, small number of repetitions, a concentration of 13.8mm / l shows that it does not tolerate high concentrations of lactic acid
9.	B.D.	Lateral midfielder	19	57	low aerobic power	6	11.56	18.7	Satisfactory time, small number of repetitions, a concentration of 18.7 mm / l shows that it does not have the capacity to work on a high concentration of lactic acid
10.	S. D.	Lateral midfielder	18	56	very low aerobic power	6	12.06	19.3	Low time, no power, small number of repetitions, has the ability to work on a high concentration if he has a specific training program.
11.	D. C.	Lateral midfielder	20	59	good aerobic power	7	12.59	22.0	Low time, no power, average number of repetitions, lactic acid concentration denotes a high tolerance capacity for this type of effort
12.	Ș.H.	Central midfielder	21	60	good aerobic power	8	12.12	19.1	Low time, no power, good number of repetitions, a concentration of 19.1 mm / l shows that it tolerates lactic acid concentrations and can work in this area
13.	A.S.	Lateral midfielder	21	60	good aerobic power	5	11.59	24.6	Satisfactory time, very small number of repetitions, lactic acid concentration denotes a high tolerance capacity for this type of effort
14.	V. S.	Left quarterback	20	59	satisfactory aerobic power	3	12.28	16.7	Lack of time, no power, very small number of repetitions, a concentration of lactic acid shows that it has reached very quickly a high level of lactic acid that it does not tolerate
15.	C. D.	Central midfielder	19	57	low aerobic power	6	12.12	20.0	Lack of time, no power, lactic acid concentration denotes that it can tolerate high lactic acid concentrations, but has no resistance to work in this effort regime
16.	S. A.	Lateral midfielder	20	59	good aerobic power	6	12.30	20.2	Low time, small number of repetitions, a concentration of 20.2 mm / l shows that he has the ability to work on a high concentration if he has a specific training program
17.	M. D.	Side defender	20	59	satisfactory aerobic power	7	12.30	22.3	Low time, average number of repetitions, lactic acid concentration denotes a high tolerance capacity for this type of effort
18.	P. E.	Forward	20	59	good aerobic power	6	11.90	16.0	Satisfactory time, small number of repetitions, concentration of 16 mm / l shows that it does not tolerate high concentrations of lactic acid

The results of the initial test at the Gacon test showed that 56.25% of the team members have good aerobic power compared to the specific job, 18.75% have satisfactory aerobic power, 18.75% have poor power compared to job specificity, and 6.25% have very low aerobic power.

From the analysis of the data recorded at the second evaluation session, we found that 75% of the team members had a poor time, and 25% had a satisfactory performance, 12.75% performed a number of 3-5 repetitions, and 87.5% performed 6-8 repetitions. Regarding lactic acid tolerance, we found that at the end of the lactacid stress test, 31.25% of the players had lactic acid concentration between 13-19 mmol / l, 8.75% had a concentration between 19.1-24.3 mmol / l. 12.75% performed 3-5 repetitions, and 87.5% performed 6-8 repetitions.

Based on the results from the initial testing, the content and the specificity of the workout effort were rethought and restructured, scheduling two workouts / week of aerobic effort and one of anaerobic lactacid effort, of power and endurance of power, individualized within the groups of athletes in positions of game. At the first stage of the competition calendar, the final test was performed. The results were analyzed and interpreted on the model of the initial testing.

At the final test, at the Gacon test the athletes improved their determined indicators: 12.5% of the team members have a very good aerobic power in relation to the specific of the job, 43.75% a good one, 18.75% satisfactory, 18.75 % weak and 6.25% have very poor aerobic power in relation to the specificity of the post.

In the further research we analyzed by comparison the results of the two tests.

In the following figure we graphed the results of the team components at one of the indicators of the Gacon test, the number of repetitions.

Fig. 1. Number of repetitions in the Gacon test

At the final test, at the speed test in anaerobic lactacid stress regime and at determining the level of lactic acid in the blood after the specific effort of the match, we found that in terms of the time made by the players, 62.5% improved their performance performed at the initial testing, 6.25% had a very good time, 18.75% a good time, 6.25% had a weak time and 6.25% unsatisfactory. Regarding the number of repetitions, 100% achieved the maximum number of repetitions (10), and regarding the level of lactic acid in the blood, 25% had between 13-19 mmol / l and 75% between 19.1- 24.3 mmol / l.

Fig. 2. Number of repetitions, performance, lactic acid level at initial and final testing

Conclusions

Through this research we tried to highlight the importance of the connection between the specific knowledge existing in the theory and practice of the field regarding the individual reactivity of football players to the effort. The results of the research on the C.S. Internațional Bălești team highlights the individual characteristics of the reactivity of the players, by positions, to the specific effort in training and competitions, by using the two tests and determining / appreciating the 5 indicators. We consider that all the tools to evaluate the individual characteristics of the reactivity / adaptation level of the players, on the team positions, used in the research can be conclusive for optimizing the preparation. The analysis and interpretation of the results of the pilot study, from the initial to the final test confirms the working hypothesis and creates premises for the use of the tests used and of the indicators determined in the regulation of the specific physical training, their values being constituted objectives of the scientific guidance of an essential component of the sports training, which is the basis of the performances of the players on the playing stations and of the team in the competitive stages.

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