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TEST FOR APPRAISING THE ENERGETICAL RESOURCES OF 10-12 YEARS OLD ATHLETES

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Abstract: *The paper presents the principles of MGM test applied during the selection stage of young athletes. Also, the MGM test provides, during the intermediate selection, some indices that describe the training level of athletes, being thus able to form groups by value, using the motrical efficiency as main factor. In order to achieve the goal of the paper, a group of 12 athletes was tested. A period of nine months separated the initial test and the final test. During this period, for each athlete a personalized training program was designed and the final test revealed its efficiency.*

Key words: *motrical skills, assessment, selection.*

1. Introduction

Currently, continuous improvement of methods of selection and training selection is required. The methods and means must provide a clear picture of the physical training stage. Trends in modern football are focused on individualization in training from an early age [7], [8]. The sample MGM [1] provides the best framework to meet the objectives of selection and training, namely to make the selection more accurate based on the real physical qualities, respectively to customized and needs-oriented training of athletes.

The investigations on the development of motrical skills of secondary school students, revealed the fact that these are lower than the current requirements for training professional athletes.

This study aimed to determine whether the MGM sample correlated with a customized physical training will lead to an improvement of the general indexes which describe the energy consumption, the anaerobic capacity effort and power-speed ratio [1] of 10-12 years old athletes.

Consequently, the selection stage of young athletes must take into account the individual progress of each athlete [7], [8]. In order to achieve this goal, the initial parameters are assessed using the MGM test, then the most appropriate training process is designed for each individual; pointing the physical training and focusing on correcting the deficiencies revealed by the initial test [8]. The final test reveals the efficiency of customized training process, comparing the final parameters with the initial ones.

The use of MGM sample for selection and training athletes of 10-12 years old constitutes a means for creating an optimal framework for development and modernization of the intermediary selection and training processes.

[1]."Dunarea de Jos" University of Galati.

The age of 10-12 years corresponds to the starting point of physical training for professional athletes, mainly the football players. Also, the MGM sample provides, during the intermediary selection, by the values of some indices that labels the training level of athletes regarding certain motrical skills during training stages, thus contributing to the formation of groups by value considering the motrical efficiency.

2. The MGM test

The MGM test, originally developed by Miron Georgescu, was reinterpreted and redefined, aiming to determine the most relevant elements of neuro-motrical qualities, of energy and control parameters [1], [2-6].

The MGM test consists of carrying out three series of 15 vertical jumps, reaching the maximum height while the time on ground is minimal [1]. The vertical jumps are carried out on both feet, on the right and on the left lower limb. A computer collects data from a special carpet equipped with pressure sensors [1].

In this test, the effort deployed by a large muscle group of the lower limb is determined [1].

The test provides two classes of parameters: the energetic and the control ones [1-6].

The control parameters are: CVE (energetical variability coefficient) and CVS (structural variability coefficient).

CVE provides information about the control state of the energy resources during unspecific motion, while CVS provides information about the athlete's capacity of controlling the ground contact.

The energetic parameters are: the average unit power (AUP), the average flying height (AFH), and the repetition rate (RR).

AUP is the energetic parameter that provides information on the force-velocity ratio and on the conditional training of football players.

AFH provides information mainly on the force and RR provides information mainly on the velocity.

3. Experimental Research

The experimental research was conducted at the Human Performance Research Centre of the Faculty of Physical Education and Sport, using the MGM platform with all the equipment and the software special designed to provide instant analysis for each tested athlete.

In the experiment a group of 12 athletes was tested. The initial data constitutes the basis for customized training toward improving those inadequate motrical skills.

The MGM test is a non-invasive one and the participant in the test were assisted by their coach, who prior to the test had obtained parental agreement.

The 10-12 years old athletes are considered to be at beginner level and they barely make contact with performance and sport competition. Hence, the need to use appropriate means for assessing the morpho-functional peculiarities and the motical qualities previously acquired by athletes.

These are the prerequisites for the optimum physical development focusing on modern trends on customized training from an early age and on correcting deficiencies.

Following the first tests and results, it was possible to assess the physical preparation of each participant and of group, with respect to overall tested parameters. A physical training program spread over a period of 9 months was designed to improve and correct deficiencies.

The program consisted of weekly cycles with specific means from football and athletics: sprints, specific means for force -

speed skills development, exercises with various efforts, medium intensity and volume, off-road races, slop, stairs, sands, force circuits with small and medium weights.

At the end of this training stage the final test of the same group of athletes was conducted, in the same conditions as the initial ones.

4. Results and Discussion

The initial MGM test results are presented in table 1 and figure 1.

CVE emphasizes the automation of movements, highlighting the control of the completion phases at high speeds. Athletes having the value of CVE parameter over the average group are not controlling the completion phases because they are led by automatic behaviour (P1, P6, P7, P8, P11). The CVE values below average group are considered to be optimal.

Recorded CVS indicates high values of the parameter, over the optimum from literature (3-3.5) expressing lack of control during all types of contact. The average group is 14 and for 6 participants in the test, the CVS values were over the average, revealing that they are not able to anticipate and control the contact phases. Only one participant (P1) recorded a value of CVS closer to the optimal value from literature.

The power unit (PU) provides information about average velocity-force ratio. This parameter can estimate whether one of the two qualities is excessive or deficient.

The average group splits the participants in two subgroups: five athletes recorded values over the average group, revealing a relatively balance between velocity and force, while other seven athletes recorded values below the average group, which express an unbalance between velocity and force.

Table 1

Vertical jumps on both legs (initial test)

Participant	CVE	CVS	PU	Deviation [%]		
				CVE (%)	CVS (%)	PU (%)
P1	7.06	4.3	4.79	3.71	-69.29	25.28
P2	5.53	10.53	3.51	-18.77	-24.80	-8.20
P3	5.95	25.69	4.33	-12.60	83.47	13.25
P4	4.05	16.27	3.60	-40.51	16.19	-5.84
P5	3.78	11.56	3.43	-44.47	-17.44	-10.29
P6	9.55	15.45	3.97	40.29	10.34	3.84
P7	9.51	17.19	3.89	39.70	22.76	1.74
P8	11.37	20.04	4.23	67.02	43.12	10.64
P9	2.15	6.83	3.45	-68.42	-51.22	-9.76
P10	4.44	12.87	3.66	-34.78	-8.09	-4.27
P11	14.28	17.79	3.69	109.77	27.05	-3.49
P12	4.02	9.51	3.33	-40.95	-32.08	-12.90
Average	**6.81**	**14.00**	**3.82**		-	

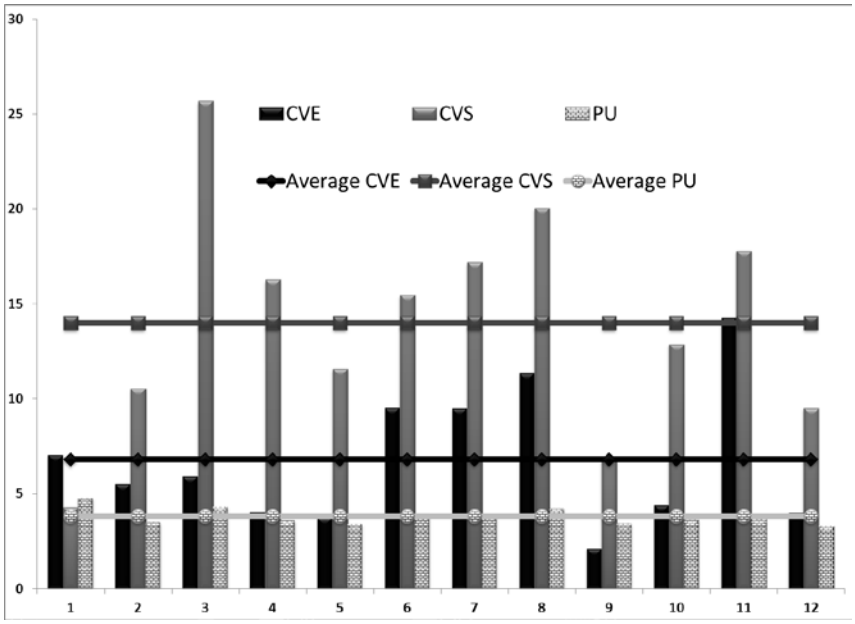

Fig. 1. *Initial test control parameters*

The final test for CVE reveals an average of 6.77 and only 3 athletes do not control the completion phases and are dominated by involuntary automatisms. The other nine athletes recorded values of CVE parameter that might be considered to be optimal.

CVS shows high values also at the final test, but the group average is lower than the average group at the initial test.

Vertical jumps on both legs (final test) Table 2

Participant	CVE	CVS	PU	Deviation [%]		
				CVE (%)	CVS (%)	PU (%)
P1	6.6	4.70	6.00	-2.45	-63.93	15.00
P2	5.52	10.50	5.26	-18.41	-19.41	0.81
P3	5.91	22.30	5.70	-12.65	71.15	9.25
P4	4.04	12.70	4.80	-40.29	-2.53	-8.00
P5	4.3	11.50	4.65	-36.45	-11.74	-10.88
P6	9.42	13.00	5.24	39.23	-0.22	0.43
P7	6.6	16.00	5.23	-2.45	22.80	0.24
P8	11.15	18.85	5.60	64.80	44.68	7.33
P9	2.95	7.05	5.30	-56.40	-45.89	1.58
P10	4.5	12.95	5.24	-33.49	-0.61	0.43
P11	16	17.30	4.89	136.48	32.78	-6.28
P12	4.2	9.50	4.70	-37.92	-27.09	-9.92
Average	**6.77**	**13.03**	**5.22**		-	

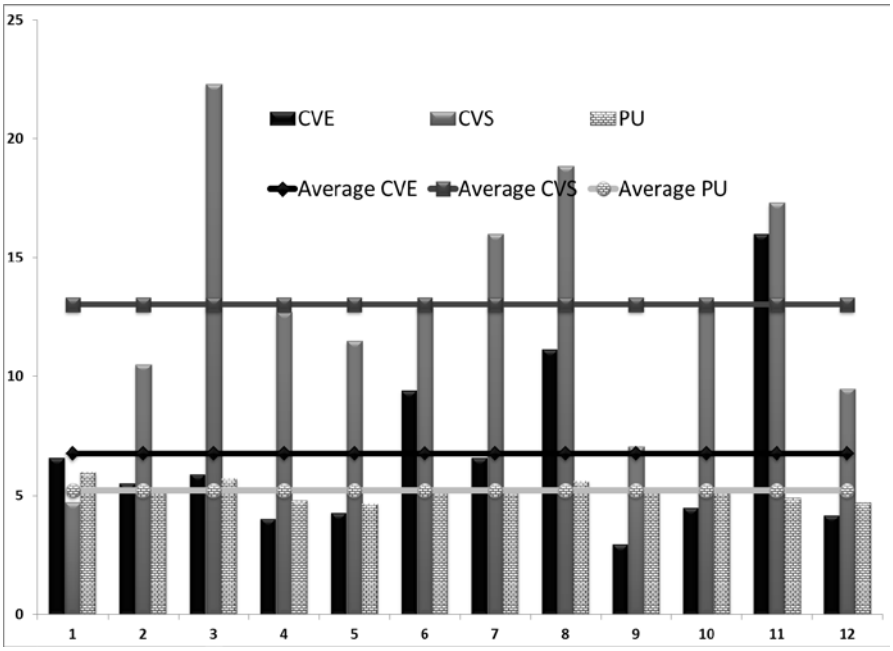

Fig. 2. *Final test control parameters*

There are eight athletes below the average group, and participant P1 is also the closest to the optimal value of this parameter in literature.

The power unit (PU) at the final test shows that eight athletes had registered values over the average group, as opposed to five athletes in the initial test, which shows an improvement of the initial value, while the other four athletes exhibit imbalance force speed ratio.

The same analysis can be performed for vertical jumping on left and right leg.

For two athletes the values of CVE parameter are above the average of the group, as opposed to three athletes in the initial test, which shows an improvement in initial parameter, for the vertical jumping on right leg. The other 10 athletes recorded values of CVE parameter which are considered to be optimal. For 9 athletes the values of PU parameter are above the average of the group, as opposed to the initial (7 athletes), which shows an improvement in initial parameter. The other three athletes (unlike five athletes in the initial test) recorded values below the average group, expressing an unbalance between force and velocity.

Comparative results between the initial and final testing are presented in fig. 3.

5. Conclusions

The experimental study using the MGM sample for 12 athletes in two stages, before implementing a training program focused on improving the motor skills and after its implementation highlights that although not all parameters have improved, some parameters have increased, revealing an improvement from basic training and that imbalances between the left and right have diminished, together with the improvement of force-velocity ratio.

Finally, the data obtained as a result of the research can be, at least for now, the starting point in further tests. However, based on objective information provided by this test, a diagnosis analysis regarding the level of physical training at some point of a certain category of athletes must be

considered. It is recommended, therefore, that based on such objective information, to design special training programs, customized ones that aim to improve performance, the selection process and the training stage of 10-12 years old athletes.

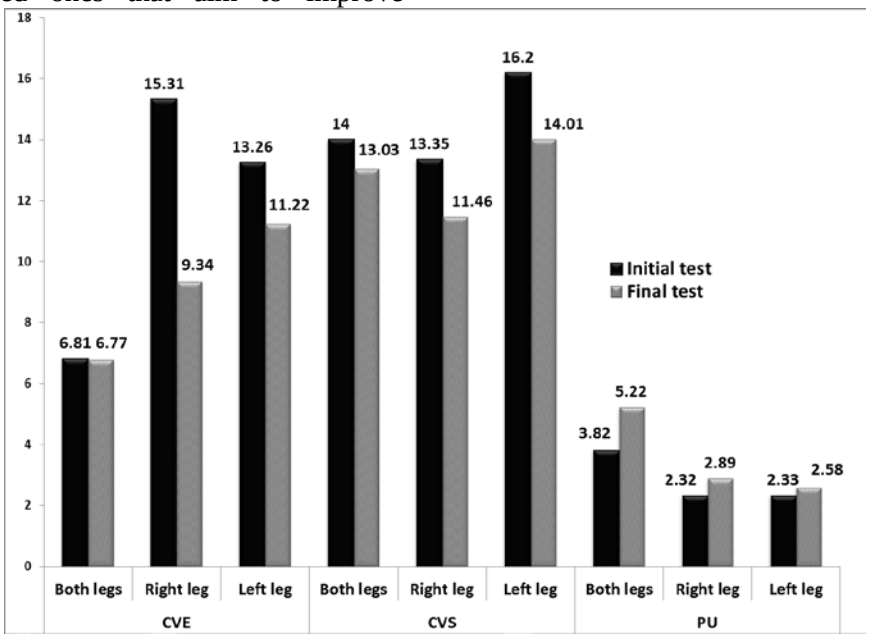

Fig. 3. *The average of CVE, CVS and PU parameters*

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