Analysis of the Results Athletes of the Test Reaction to a Moving Object

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Abstract

The analysis of early and late feedback data for athletes on a moving object allows us to interpret the balance data, the degree of equilibrium of excitement and inhibition in athletes in the experimental. When comparing the number of leading and delayed reactions in players tested in the control group after an educational experience, it was found that in the majority (43.8%) the number of advances (early reactions) exceeded the number of delays. This fact indicates an imbalance in neurological processes with the predominance of excitation force. At the same time, the number of athletes in this group, whose response was delayed, reached 37.5%, suggesting dysfunction of neurological processes, with the predominance of inhibition. Only 18.7% of athletes are diagnosed with equilibrium in neurological processes. The indices of the number of delays and advances are approximately equal and differ slightly from each other (R> 0.05).

Keywords: *Athletes, test reaction, moving object, neurological process, excitation and inhibition.*

Introduction

The specificity of specially regulated muscular activity of athletes has a beneficial effect on the formation of functional systems that contribute to the adaptation of the central nervous system to the successful implementation of technical mathematical procedures. To develop the ability to differentiate and differentiate between muscular efforts, it is necessary to take into account the degree of development in athletes: coordination of movements, especially balance, the accuracy of movements when confronted with gravity and elasticity, the balance of neuronal processes, and kinetic and dynamic parameters of movements when implementing mathematical performance techniques compared to the characteristics of the model. Therefore, the reaction of the athlete to a moving object should be studied to contribute to activities aimed at developing the ability to distinguish between muscular efforts and aimed at improving the functions of the central nervous system, increasing movement and the degree of balance of neurological processes in athletes [1, 2, 5, 9].

Materials and Methods

The data analysis took into account the number of premature and delayed reactions. An analysis of the results allows us to interpret the balance data, the degree of balance of the processes of excitation and inhibition in strength among the athletes of the experimental group [3]. When comparing the number of leading and delayed reactions in the tested players of the control group after a pedagogical experiment, it was found that in the majority (43.8%) the number of advances (premature reactions) exceeds the number of delays. This fact indicates the imbalance of nervous processes with a predominance of excitation strength. For subjects of this group, characterized by a significant number of leading reactions, the obvious reason is an increased level of excitability, manifested in fussiness, intolerance during training sessions, as well as game activity in the process of competition.

At the same time, the number of athletes of this group, whose response was delayed, amounted to 37.5%, which indicates the imbalance of nervous processes, with a predominance of inhibition. It is noted that only 18.7% of athletes are diagnosed with a balance of nervous processes. Their indices of the number of delays and advances are almost equal and slightly different from each other (R> 0.05) [2, 6].

Results and Discussion

An analysis of the data of the experimental group allows us to note that the number of leading and delayed reactions in the majority (81.3%) of tested soccer athletes after the pedagogical experiment does not differ significantly. This suggests that they have a balanced process of excitation and inhibition. At the same time, 18.7%.Subjects of the experimental group, marked imbalance of nervous processes with a predominance of excitation strength, as evidenced by the number of premature reactions [4].

Along with this, it was noted that the athletes of the EG, in comparison with the athletes of the CG, have lower indicators of inaccurate "Reaction to a moving object" time. The average values of the total reaction time of "advances" and "delays" are less among EG athletes than in the control group. This indicates a higher strength of the processes of excitation and inhibition, as well as their balance (Table 1).

Table 1: The average group values of the indicators "Reaction to a moving object" after a pedagogical experiment (%)

Indicators RMO	Control group n = 16 people n measurements =(800)	Experimental group n = 16 people n measurements = 800	R
accurate reactions	17,4±5,4	71,4±6,3	< 0,01
advances	32,4±6,9	15,2±5,7	< 0,05
delays	49,8±11,2	13,4±5,8	< 0,01

Thus, the training process aimed at developing the ability to differentiate muscle efforts contributes to greater activation of psycho-functional processes in the aspect of an adequate assessment of the athletes'Spatio-temporal situation [7]. The RMO indices of athletes of the experimental group indicate that the technique aimed at developing the ability to differentiate muscle efforts contributed to the development of the ability to anticipate the temporal parameters of the appearance of the stimulus (stimulus in the test of the color signal, and the game of the ball when it is received) and to compare its sensory regulation with it their movements.

The results of diagnostics of the mobility of nervous processes by the test "Reaction of choice"

Analysis of research in game sports suggests that focused exercises help optimize the balance of the processes of excitation and inhibition. It is indicated that the positive dynamics of the speed of the complex acts as a consequence of special training on the one hand and as a necessary condition for improving sportsmanship, including technical. To find out the effectiveness of the means used in the framework of the technique of technical training of Athletes aimed at developing the ability to differentiate muscle efforts, the test **"Choice Reaction"** was conducted. During testing, each test subject was consistently presented with red and green light signals with an interval of 0.5 to 2.5 seconds. The total amount of signal presentation is 70 times. In this case, the red color was taken as the main one, and green as the secondary one 5, 10. The test results are presented in table (2).

Table 2: The average values of the main statistical indicators for the test "The reaction of choice" binocular examination (n = 16 people, n measurements = 1120±X

Experiment timeline	Groups	average value, ms	standard deviation, ms	Number of errors	
				on the main color (red)	on the background. Color (green)
Start	CG	376,4±25,4	61,3±16,4	1,6±0,4	1,8±0,2
	EG	369,4±27,6	60,7±16,3	1,5±0,4	1,7±0,4
R		> 0,05	> 0,05	> 0,05	> 0,05
Ending	CG	362,32±18,1	51,3±15,4	1,3±0,3	1,1±0,2
	EG	301,26±12,4	35,7±11,2	0,2±0,4	0,1±0,1
R		< 0,05	< 0,05	< 0,05	< 0,05

The indicators of this testing allow us to state that the methodology for the development of differentiation of muscle efforts had a positive effect on the higher dynamics of the development of sensorimotor reactions in athletes of the experimental group compared with the average group results of the control group. The mobility of the nervous processes in them is significantly higher, according to indicators of the average value of the reaction time of choice (R <0.05). Moreover, the majority of subjects from the control group (68.75%).

The individual average reaction time is higher than the average, which indicates that the nervous processes are inert, and for athletes from the experimental group (81.25%) This ratio is the opposite, the average reaction time is lower than the average, or individual values are close to it (below, but they do not differ significantly), which indicates the mobility of their nervous processes [1, 9]. Similar results for the diagnosis of complex visual-motor reactions were obtained in the test "Distinction Reaction".

Subjects athletes from the control and experimental groups were asked to choose from several color stimuli and respond by pressing the button of the visual-motor analyzer with the finger of their leading hand only upon presentation of a red light stimulus [2,5].

Table 3: The average values of the main statistical indicators for the test "Distinguishing reaction" and "Simple visual-motor reaction" Athletes in the control and experimental groups)n = 16 people, n measurements = 1120±X

Experiment timeline	Groups	the average value, ms	standard deviation, ms	SVMR ms	The difference between SVMRand DR, ms
Start	CG	392,1±67,4	61,3±16,4	228,8±11,4	163,3±10,2
	EG	389,8±65,2	60,7±16,3	226,7±10,6	163,1±10,1
R		> 0,05	> 0,05	> 0,05	> 0,05
Ending	CG	372,1±67,4	59,3±19,4	222,4±8,1	149,7±3,5
	EG	278,9±24,4	37,5±15,1	198,7±8,7	80,2±2,1
R		< 0,05	< 0,05	< 0,05	< 0,05

The results of the average values for the test "Distinction Reaction" among players who studied according to the experimental methodology significantly differ from their opponents, with whom training sessions were conducted according to the traditional method. During the pedagogical experiment, the athletes of the experimental group recorded a positive trend in the decrease in the average group data compared with similar results in the control group. In this case, the difference between the reaction time in the test "Distinction Reaction" and a simple hand-eye reaction at the beginning of the experiment is practically was equal in groups (CG - 163.3 ± 10.2 ms and in the EG - 163.1 ± 10.1), which characterizes the same signal processing time by the cortical part of the analyzer. After the experiment, the indicator of this difference decreased significantly among the athletes of the experimental group compared to the same parameter for the athletes of the control group 80.2 ± 2.1 ms and 149.7 ± 3.5 ms, respectively [1, 3, 6].

A similar comparison of the indicators in the "Simple visual-motor reaction" test and the "Choice Reaction" test indicates a similar nature of the changes. However, the indicators of the difference at the beginning of the experiment within the groups were respectively in the control - 147.6 ± 4.4 ms, and in the experimental - 142.7 ± 5.1ms. moreover, after at the end of the experiment, a horizontal intragroup comparison between the average group indices of "Simple visual-motor reaction "and " Distinguishing reaction" in the control group allowed us to record a slight improvement in the results, and the difference was 139.9 ± 7.4 ms, which did not significantly differ from the initial data. In the experimental group, such a change is much larger. At the end of the pedagogical experiment, the athletes of the experimental group, the difference between the reaction time in the test "Simple visual-motor reaction "and the test "Reaction of choice" was 102.6 ± 5.43ms.

Changes in indicators characterizing the differences in the reaction time between the results in the tests " Simple visual-motor reaction ", "Reaction of choice" and "Reaction of discrimination" at the beginning and at the end of the pedagogical experiment are presented in Figure 1[4,5,10].

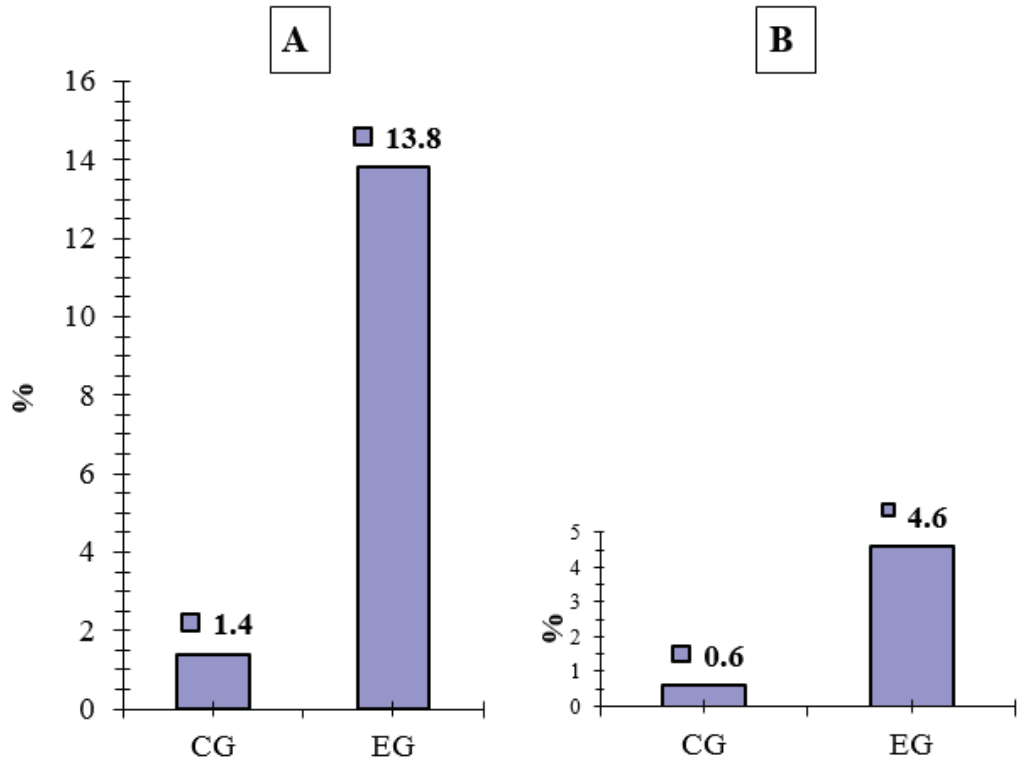

Figure 1: Changes in indicators of the reaction time in the test"Distinguishing Reaction" and" Simple visual-motor reaction" (A) and in the test "Reaction of Choice" and" Simple visual-motor reaction(B) at the beginning and at the end of the pedagogical experiment in athletes of the CG and EG.

It was revealed that the dynamics of simple and complex sensor motor reactions (Simple visual-motor reaction of discrimination and choice) among athletes of the CG and EG is characterized by a decrease in time parameters during the pedagogical experiment. At the same time, classes aimed at the purposeful development of the ability to differentiate muscle efforts, contributed to a greater degree to improving the functions of increasing mobility and the degree of balance of nervous processes in athletes of the experimental group[8,7].

Conclusion

The specificity of the specially organized muscle activity of the experimental group Athletes has a beneficial effect on the formation of functional systems that contribute to the adaptation of the central nervous system to the successful implementation of technical sport actions.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

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