The spatial orientation of the players with different type of nervous system

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ABSTRACT:

The purpose of this article is to obtain and summarize the data obtained in the new study, namely the change in performance of the spatial orientation of the players 12-13 years old with different typological peculiarities of nervous system properties. The leading methods to research this problem are ascertaining and formative pedagogical experiment, theoretical analysis and summarizing of methodological literature and methods of mathematical statistics. For 8 months of the experiment there was a significant increase in the ability to navigate in space, in the experimental group, which was engaged in by a special methodic. Players with a strong nervous system indicator has increased from 16.2 of±0.5 to 14.9±0.2 s (p<0.05), and players with a weak nervous system – from 15.8±0.4 to 14.8±0.5 (p<0.05). In the control group also saw the positive, but not significant changes (p> 0.05).

Conclusion - the article can be useful for coaches, who are preparing not only young players, but also applied in other sports. The urgency is due to the search of improvement of training process of young players who will improve the spatial orientation of children and will improve their results in football.

KEY WORDS: football players, nervous system, typology, spatial orientation.

INTRODUCTION

In 2018, Russia will host the world Cup. This event is an important impetus to the development of football in Russia. Undoubtedly, to prepare future players to achieve their greatest victories in football need to rethink the completely training system. Need to start with football for children and young people.

The technique of the player is largely dependent on the level of development of coordination abilities [1, 13, 14].

The Foundation of sports skills of the players are exactly the specific coordination abilities, which are the basis of technical readiness of footballers. The level of skills of the athlete largely determines the performance and entertainment of the game [12].

One of the most important specific coordination abilities in the technical preparation of the players is the ability to spatial orientation [1, 18].

A. Stula believes that a player's ability to coordinate their movements and orientation in spatial is the basis of its high technical readiness [18].

I. V. Averyanov speaks of the need to develop specific coordination abilities of players from the early stages of learning, including spatial orientation [1].

A favorable period for the development of spatial orientation is children's 13 age [2, 5, 3, 9].

At the age of 11-13 years’ structure of the motor endings reaches adult levels, resulting in improved ability to control spatial parameters of movements, improving the accuracy of differentiation of efforts [5].
V. G. Bauer found that 11-13-year-old players, there is an intensive development of the capacity for spatial orientation [2]. G. S. Lalakov characterize the age of 13 as one of the most favorable periods for learning the basic techniques of football. Thanks to the intensive development of spatial orientation, children can teach practically all movements that require precision and high coordination [9].

According to Chernetsov M. M. age 8-13 years favorable for the development of coordination abilities. Their natural growth at this age is 56%. The ability to spatial orientation for 12 years, reaches adult [3].

The value of the differentiated approach in training athletes is hard to overestimate [3, 6, 17].

A differentiated approach is a method of combining athletes in groups according to their athletic qualities and use for each group of certain methods of training adequate to their typical characteristics, such as gender, age, properties of temperament, level of fitness etc. [16].

One of the most effective criteria for the separation of players into groups is a different typology of their nervous system.

Under the typological features of manifestations of properties of the nervous system refers to the strength and weakness of the nervous system on the initiation process. Namely, one player type of the nervous system can be strong and the other weak.

The efficacy of the use of typology in sport proven by many specialists [7, 8, 19].

Persons with a weak nervous system, faster at learning complex technical elements, and those with strong nervous system are better in competitive conditions [19].

Koz'minikh M. Y. found that persons with a weak nervous system is more sensitive and able from the outset to work with great intensity. In terms of switching from work to leisure, benefits have persons with strong nervous system [7].

O. N. Krivoshchekova developed and introduced the option of training load speed-power orientation for young gymnasts, which included changing the main parameters of the load (volume and intensity) with the strength of the nervous system on the initiation process. Studies have shown that individuals with a weak nervous system the greatest training effect is achieved when using a bulk load, and for persons with strong nervous system with intense stress [8].

Training of tennis players, conducted without regard to individual abilities, significantly inhibits the growth of sportsmanship. The performance of the athlete causes weak nervous system, and patience – strong [20].

However, in scientific researches, devoted to the study of typology is not detected data relating to the football players.

Thus, the aim of the study was to improve the technical training of young football players with different typology due to the development of the capacity for spatial orientation.

Thus, it is known that coordination abilities of players play a leading role in their technical training. Typology of the nervous system improves the efficiency of the training process. It is assumed that the experimental method will improve the quality of technical actions of football players who do exercises with different loading depending on the type of nervous system.

To achieve the aims and verify the hypothesis of the study addressed the following objectives:

1) determine the level of development of spatial orientation of the players 12-13 years;
2) develop an experimental methodic to develop the spatial orientation of 12-13-year-olds based on the typological characteristics of the nervous system;
3) to study the effect of the experimental methodic.

MATERIALS AND METHODS

1. Theoretical and empirical methods

To test the hypothesis used a variety of methods:
- theoretical methods: analysis of scientific and methodical literature, studying of working documents and materials on the problem, studying existing programs and systems of training of players;
- empirical methods: pedagogical experiment, including diagnosis of nervous system excitation process [15], the method of assessment of the level of development of ability of spatial orientation [10], as well as methods of mathematical statistics [21].

2 Base of the research

The main base of the research was youth sports school №5 of Kirov.

3 Stages of the research

Research was perform on four consecutive stages:
1) Theoretical analysis and generalization of literature.
2) Defined the object, subject, purpose and hypothesis, selection of tests for determination of the studied characteristics. Was develop an experimental methodic based on differentiation of players into groups based on their typology, their nervous system.
3) Conducted a formative pedagogical experiment. In the course of the experiment was investigated the effectiveness of the methodology used to develop the spatial orientation of 12-13-year-olds.
4) The analysis of the received results of experimental researches, defined the main conclusions.

4 Evaluation criteria

The efficacy of the methodic was perform using the following evaluation criteria:
- change in indicators of the capacity for spatial orientation during the experiment, the players with different nervous system;
- Evaluation of the spatial orientation determined by a test "run to the numbered balls".
In the semicircle with radius 3 m is located at the same distance of 1.5 m from each other five numbered stuffed balls, but without the order numbers. The sixth medicine ball installed at a distance of 3 m from the others. The player stands with his back to the five printed balls so that the front part of his foot touched the sixth medicine ball, lying in front of him. At the signal, he touches the ball with any foot, and at this point, the experimenter shows a card with a number on the ball, which he after the turn must run and touch it with his feet. Then it was back to sixth printed the ball, and the moment it touch the experimenter shows a card with the next number, etc. So, running the race to all five printed balls. The test ends when the subject touch the sixth medicine ball of any foot.

The result: running to numbered stuffed balls (C). The measurement accuracy of the test is up to 0.01 s.

Remark. The sequence order of the numbered medicine balls, and show numbers on the cards should be change after each test. [11].
- the result of friendly matches in beginning and at the end of the experiment between the control and experimental group.

5 Experimental procedures and its description

The main pedagogical experiment conducted based on youthful sports school № 5 of Kirov.

The essence of the pedagogical experiment is to use different loads to develop the ability to spatial orientation of the football players with different nervous system.

The experiment structured in the following way:
1. The organization of the control and experimental groups and subgroups in them.
2. Determination of the level of development of an ability to spatial orientation and determination of strength of the nervous system players.

Selected tests are the most popular and frequently used in previous research [10, 15].
3. Conduct of the main pedagogical experiment.

In our study, we purposefully develop the ability of players to spatial orientation.

Special attention paid to the differentiation taking into account typological characteristics, namely the strength and weakness of the nervous system in the process of excitation in.

The essence of the experimental procedure was the following:
1) Use a differentiated approach to the choice of physical exercises for development of spatial orientation, including the power of the nervous system. The means of achieving the result was a technical exercise, well known for the players: game with football elements, shots on goal after flops back and forth, playing two balls, playing with numerical superiority of the enemy, running with changes of direction, running backwards between the uprights, the game with two balls, the game of three gates.
2) After warm up for 30 minutes, the players in the experimental group performed exercises for the development of spatial orientation.

3) Methods the experiment is repeat, variation, role, competitive; 4) loads of players.

The main feature of the methodic was that players with different nervous system performed one exercise with different loading. Load, for players with a strong nervous system was more intense, and for players with a weak nervous system was more voluminous.

The players with a strong nervous system, the intensity of the load increased by increasing the amount of exercise and decrease rest intervals between exercises and between the series of exercises.

The players with a weak nervous system the volume load increased by increasing the number of repetitions and rest intervals.

The intensity of performing exercise (140-160 beats per minute), rest time (up to full recovery, pulse 100-120 beats per minute) the nature of recreation (passive) were the same for players with strong and weak nervous system.

The duration of performing exercise the players with a strong nervous system was 1-2 minutes, and weak - 2-3 minutes.

The number of repetitions the players with a strong nervous system was 5-7 times in the series, and from the weak - 6-8.

The number of series with a strong nervous system 5-7, weak - 6-8.

5) Methods:
- The introduction of new exercises;
- Complexity of previously learned exercises, increase speed.
- Decrease and increase speed during exercises.
- Complexity of the exercises an additional means.
- The introduction of multiple goals into the exercise.

The experiment involved 30 football players aged 12-13 years. Equipment the control and experimental groups conducted by random selection, based on the typology of the nervous system.

Control group (CG), which had players with strong and weak nervous system, doing a standard program for sports schools [4].

The players of the experimental group (EG) was involved in the developed methodic, whose purpose was to improve the technical training at the expense of purposeful influence on the ability to spatial orientation. During the year was 130 workouts, each at 90 minutes.

4. Measurement of parameters after the main pedagogical experiment.

5. Statistical and mathematical development of the basic pedagogical experiment.

To determine the reliability of the results of the pedagogical experiment, the data were processed using mathematical statistics methods, namely using parametric tests (t-test student’s) [21]. Statistical processing of the results performed using the Pentium 4 and Microsoft Excel 2007. Correlation analysis performed using the software Bio Stat 2009. The result when the value of P> 0.05 considered significant.

6. The formulation conclusions and practical recommendations.

STATISTICAL RESULTS
Before the main experiment, significant differences between the performance of players with strong and weak nervous system is not detected (P>0.05).

Before the pedagogical experiment was held a friendly match between EG and KG, KG players won with a score of 3-2.

In both groups and subgroups their performance in football players 12-13 test "Run to the numbered balls" correspond to the low level of development of spatial orientation for this age [12]. Changes in indicators of the capacity for spatial orientation of the football players 12-13 years are present in table 1.

For the period of the pedagogical experiment, the indices in the test "Run to the numbered balls" improved in both groups.

In KG performance improved not much as the football players with a strong nervous system and players with a weak nervous system (P>0.05).

In the EG there have been significant changes. The football players with a strong nervous system performance improved to 14.9±0.2 s (P<0.05), and players with a weak nervous system to 14.8±0.5 s (P<0.05). The level of development of the capacity for spatial orientation has been above average [12].

After the pedagogical experiment between teams EG and KG played their second test match. The victory was won by the team EG with the score 4-1, which indirectly confirms the effectiveness of the proposed method.

**DISCUSSION**

The level of development of coordination abilities of football players is the basis of his technical skill. Among the many coordination skills notably the ability to navigate in space what is necessary in game activity of players of different ages [1, 9, 11, 12].

In most studies aimed at studying the coordination abilities of the football players is determined by the total load on all football players. Some studies have identified methods and physical exercises that are an effective means of development of coordination abilities [4, 5, 13].

Emphasizes the importance and effectiveness of a differentiated approach that can identify the capabilities of the athletes [3, 6]. At the same time, today there is a lack of a technique that uses the differential approach used in the typological characteristics of the nervous system properties. There is no clear understanding of what tools, methods and stress components should be used for the development of the abilities of athletes with different typology.

Although the importance and effectiveness of using typological criteria was emphasized long ago [7, 8].

In our study, the use of typological peculiarities of nervous system properties as differentiation criteria athletes in the group complied with its effectiveness and was supported by the studies conducted earlier in other sports [19, 20]. The fact that when working with athletes with a strong nervous system, you must use an intense workload, and for athletes with a weak nervous system is the volume.

In the study described in detail the tools and techniques development of the ability to navigate in space young players. Fully proved the hypothesis that the method of differential development of the ability to navigate in space, based on a typology of young players can improve the level of development of coordination abilities and the quality of their technical training.

In the experiment, obtained results, and specific recommendations on working with young players with different typological peculiarities of nervous system properties.

**CONCLUSION**
The impact methodic has had a positive impact on the level of development of abilities to spatial orientation of young football players in the EG for players with a strong nervous system and players with a weak nervous system (P <0.01).

In the CG the results of the test “Run to the numbered balls” also improved, but their value was not significant (P > 0.05).

It should be noted that the achieved level of development of spatial orientation in the EG after the pedagogical experiment can be considered high for children of 12-13 years [12].

The effectiveness of the use of experimental methodic can be confirm by the results of friendly matches after the experiment. Team EG defeated team KG with a score of 4-1.

The results, of course, show the effectiveness of the experimental methodic.

RECOMMENDATIONS

The data, obtained after conducting of pedagogical experiment are of practical interest for coaches in sports schools. The article describes in detail the means and methods impact on the football players having a different nervous system for the excitation process. It should be remembered that in the training with children, it is necessary to use a differentiated approach, especially based on typology. This approach will allow more effective to develop technical abilities of football players. You must also use tests that evaluate the level of development of different abilities. Their performance will allow correcting training process in the right direction.

REFERENCES