

BIOMECHANICAL MEANS OF THE OPTIMIZATION OF POSTURE AT THE SHOOTING WITH THE PISTOL

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INTRODUCTION

The mastering by rational technique and the fixing of one in motion acquirments have paramount importance for the increasing of the level of athlete's technical skill. Biomechanical criteria for the evaluating of technique and means of control and check for technical skill are introduced into sport training practice and that furthers the solving of this motion task.

Stability control of body and its separate biolinks at the coordinating with the pulling of the trigger is one of principal problems in shooting sport. Such state of "shooter-arms" system under that the present vibrations of arms in decisive moment of shot executing do not exceed the effective zone of the sighting may be considered as stabil relatively. What way is this stability achieved by?

Specialized motion actions of bullet-shooter from the point of biomechanics view are the results of joint actions of external and internal forces. External forces at the shooting are body's gravity force, arms' gravity, inertial forces, medium resistance and oth. Internal forces characterize the ability of shooter's organism to develop necessary forces for the keeping of pose and the holding of arms.

By proceeding of above-mentioned the stability of "shooter-arms" system is a necessary condition for good shooting and so the detail analysis of all factors that are able to change the stability is of not only theoretical but practical interest.

The purpose of this investigation is the improving of movement abilities of bullet-shooters by the using of a system of pedagogical means for the control of coordination structure of their motion actions at the training process.

Following tasks have been solved in order to achieve the objective that we put:

1. To research the specialities of shooters' body stability in the pose "the preparation to shooting" at the conditions of executing of motion tasks with different pedagogical directivity.
2. To construct the methodology for the improving of coordination structure of bullet-shooters' motional actions.

METHODS

The following research methods: stabilography, seismotremography were used.

We constructed the methodology for the improving of coordination structure of shooters' motional actions by the using of a special gravitation suit (Laputin, A.N., 1986). Its essence consists of the usage of weights for the creating of additional resistance to the contraction of working muscles. The mass of each weight using by athlete is distributed between corresponded muscle groups in proportion of their masses.

Experimental researches carried out in preparing period of year cycle.

RESULTS

The following parameters of athletes from experimental group improved with authentic statistics after the experiment finish: the quantity of body's vibrations in frontal ($P<0.01$) and sagittal planes ($P<0.05$), the frequency of body's vibrations in frontal plane ($P<0.05$), total frequency of pistol's vibrations ($P<0.05$), total time of pistol's small vibrations ($P<0.05$) increased; the amplitude of body's vibrations in sagittal plane ($P<0.05$) and the amplitude of body's vibrations in frontal plane ($P<0.05$), the amplitude of pistol's big vibrations ($P<0.05$) decreased.

Moreover a number of another parameters improved: the frequency of body's vibrations in sagittal plane increased 21.05% above, total time of sighting increased 1.27% above, the body's vibrations in frontal plane increased 10% above, the amplitude of the pistol's small vibrations increased 6.37% above and the amplitude of pistol's vibrations 0.1s prior the shot increased 16.57% above. But these modifications are not different of initial data with authentic statistics ($P>0.05$).

By analysing the modifications of shooting resultant parameters it's necessary to indicate that authentic improving of sport results ($t=2.47$ at $P<0.05$) is fixed with the shooters from experimental group.

Positive modifications of biomechanical characteristics of shooters' technique that caused by the introducing of special technical means to the educational-training process promote the increasing of their technical skill and the increasing of the efficiency of athletes' competitive activity.

CONCLUSION

1. The stability of shooter's body is an integral parameter determined the state of regulator mechanisms for coordinations of athlete's motional responses at the process of the preparing to the solving of special motional tasks of competitive activity.

2. The change of conditions of gravitation interactions at the executing of standard shooting exercises results into promotion of body's stability that is showed by the increasing of: the quantity of body's vibrations in sagittal plane 2.78% above, in frontal plane 15.98% above, the frequency of body's vibrations in sagittal plane 21.05% above, in frontal plane 8.17% above; by the decreasing of: the amplitude of body's vibrations in sagittal plane 7.99% above, in frontal plane 10% above, the period of body's vibrations in sagittal plane 11.12% above, in frontal plane 5% above.

3. It is proved it is worth-while to use a special gravitation suit that does not violate a total natural geometry of athlete's body mass as a most effective means for the intensification of shooters' training process. The intensity of directional pedagogical actions increases 20% above on the average under that.

REFERENCES

1. Bogen, M.M. (1985). The training onto motional actions. Moscow: Fizcultury and Sport.
2. Laputin, A.N. (1986). The training onto sport movements. Kiev: Zdorovya.
3. Mikhaylov, B.E., Fedorczev, V.V. (1987). The problems of theory about technique of bullet shooting. Moscow: DOSAAF.