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Biological Markers of Fitness among Qualified Athletes in Greco-Roman Wrestling

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Abstract- The article presents the dynamics of the fitness indicators among qualified athletes in Greco-Roman wrestling in the process of their pre-competition training, as a reflection of adaptive changes during performed exercises. The changing dynamics of the studied indicators and their variability during pre-competition training is a phenomenon of functional reactions of the body's internal systems. Adaptive changes in the energy systems of qualified athletes in the process of training highlight the specifics of training work in Greco-Roman wrestling. It is crucial to control these changes during a series of shock training loads of each weekly microcycle.

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Biological Markers of Fitness among Qualified Athletes in Greco-Roman Wrestling

Khoren Tonoyan [α], Lyubov Tarasova [σ] & Alexander Korzhenevskiy [ρ]

Abstract- The article presents the dynamics of the fitness indicators among qualified athletes in Greco-Roman wrestling in the process of their pre-competition training, as a reflection of adaptive changes during performed exercises. The changing dynamics of the studied indicators and their variability during pre-competition training is a phenomenon of functional reactions of the body's internal systems. Adaptive changes in the energy systems of qualified athletes in the process of training highlight the specifics of training work in Greco-Roman wrestling. It is crucial to control these changes during a series of shock training loads of each weekly microcycle.

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I. Introduction

During the pre-competition period, qualified athletes in Greco-Roman wrestling undergo shock training, which is accompanied by strong functional reactions of the body's internal systems[1]. The number of functional shifts in the body depends on the training load power and the degree of adaptive reactions. Taking into account the special nature of the training work in Greco-Roman wrestling, it is crucial to consider the internal tension of the functional systems. The duration and the intensity of the work performed during pre-competition training can lead either to premature fatigue or to overstrain, which in fact determines the relevance of this study.

II. Goal of the Study

To examine the adaptive changes of the energy systems of qualified Greco-Roman wrestlers in the process of training.

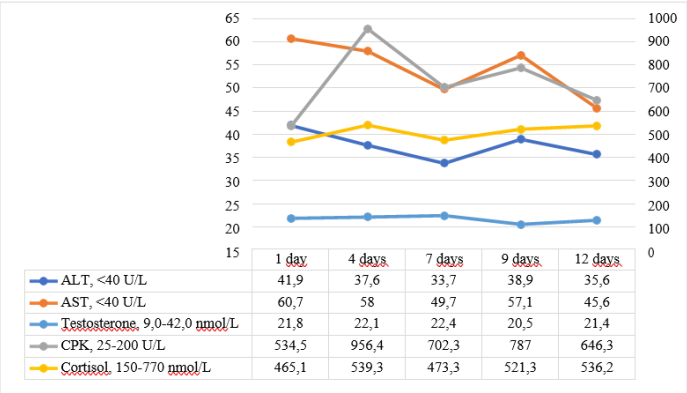
III. Methods and Conduction of the Study

The control of the studied indicators was executed in the context of the current surveys in the pre-competition period. The study has covered the dynamics of enzymatic activity of ALT and AST, the activity of creatine phosphokinase, and the balance of anabolic and catabolic processes in a two-week microcycle of pre-competition training of qualified athletes in Greco-Roman wrestling (n = 24).

IV. Results and Discussion

No unified approach to the assessment of the adaptive mechanisms of the body's energy systems of qualified Greco-Roman wrestlers was found [2, 3, 4, 5], which has become a prerequisite to this study, having been carried out at the stage of pre-competition training using standard training loads.

The dynamics of the fitness indicators among qualified athletes in Greco-Roman wrestling are presented in Figure 1.



	1 day	4 days	7 days	9 days	12 days
ALT, <40 U/L	41,9	37,6	33,7	38,9	35,6
AST, <40 U/L	60,7	58	49,7	57,1	45,6
Testosterone, 9,0-42,0 nmol/L	21,8	22,1	22,4	20,5	21,4
CPK, 25-200 U/L	534,5	956,4	702,3	787	646,3
Cortisol, 150-770 nmol/L	465,1	539,3	473,3	521,3	536,2

Fig. 1: Dynamics of biochemical indicators in the process of pre-competition training of qualified athletes in Greco-Roman wrestling analysis indicators in youth handball players.

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Negative dynamics of enzymatic activity of ALT and AST has been noted throughout the entire sporting event, which points out a directed decrease in the tension of the heart muscle, being an indicator of adaptive changes in the body's energy systems of qualified athletes in Greco-Roman wrestling, whereas the activity of creatine phosphokinase in the fourth, shock training day (956.4 ± 603.2 U/L) increased, displaying the tension of the muscular system in response to the background impact of the training load. Simultaneously, an excess of the physiological norm of the AST indicator (60.7 ± 67.1 U/L) on the first training day, as well as the excess of creatine phosphokinase throughout the entire sporting event have been noted.

The dynamics of the stress hormone cortisol reflects the effect of shock training loads on the fourth and ninth days (539.3 ± 99.0 nmol/L and 521.3 ± 111.3 nmol/L, respectively) compared to a stable testosterone ratio throughout the entire sporting event.

The high variability of AST indicators on the first day and creatine phosphokinase throughout the entire pre-competition training points out a different level of adaptive reactions of the athletes' bodies in response to the training load taken.

V. Conclusions

The results of the study have shown the dynamics of adaptive changes in the energy systems of qualified athletes in Greco-Roman wrestling in the process of training, the markers of which are the most notable indicators of AST at the beginning of the training event; of creatine phosphokinase on the loading day of the first training microcycle; and of cortisol in a series of shock training of each weekly microcycle.

The figure of adaptive changes in the body's energy systems athletes in Greco-Roman wrestling should be considered as biological markers of fitness in the process of pre-competition training.

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