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СЕКЦИЯ 3. ФИЗИОЛОГИЧЕСКИЕ, ПЕДАГОГО-ПСИХОЛОГИЧЕСКИЕ ПОДХОДЫ И ВОПРОСЫ МЕЖДИСЦИПЛИНАРНОЙ ИНТЕГРАЦИИ В ПОВЫШЕНИИ ЭФФЕКТИВНОСТИ ЗАНЯТИЙ ФИЗИЧЕСКОЙ КУЛЬТУРОЙ И СПОРТОМ

SECTION 3: PHYSIOLOGICAL, PEDAGOGICAL-PSYCHOLOGICAL APPROACHES AND ISSUES OF INTERDISCIPLINARY INTEGRATION IN INCREASING THE EFFECTIVENESS OF PHYSICAL EDUCATION AND SPORTS

THE MAIN PROBLEMS OF WORKLOAD CORRECTION FOR ADOLESCENT ATHLETES IN BODYBUILDING

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Annotation. The data presented in this paper concerns one of the most acute problems in modern bodybuilding related to the determination of optimal parameters of load indicators, taking into account the physiological characteristics of adolescents' adaptation to external physical stimuli. The existing patterns of hypertrophy of these muscle fibers in bodybuilding, depending on the characteristics of the power load regimens for adult men, do not allow for achieving the desired adaptation effect in adolescence. The problems are associated with different adaptive reserves of the main energy sources depending on age and level of training. These reserves ensure the practical implementation of training activities. The other important problem in adolescence is the destabilization of the neurohumoral system and its impact on the processes of long-term adaptation of athletes to different volume and intensity power loads. Accordingly, the effectiveness of the development of optimal load regimens aimed at accelerated growth of muscle mass and indicators of maximum strength in adolescent athletes also causes a number of controversies among scientists.

Key words: bodybuilding, adolescent sportsmen, load regimes, adaptation.

Introduction. With the growing popularization of bodybuilding in the world, the number of adolescents engaged in this sport actively is increasing. However, bodybuilding scientists and practitioners face several urgent problems related to the determination of optimal parameters of load indicators, taking into account the physiological characteristics of adolescents' adaptation to external physical stimuli [1, 3, 7]. The difficulty of solving this problem is primarily connected with the low level of practical implementation of the existing instrumental non-invasive and invasive methods of diagnosing adaptation and compensatory reactions [2, 6]. The absence of a clear algorithm for using empirical methods for assessing adaptive body changes in athletes, especially in adolescence, practically eliminates all efforts to improve the functional capabilities of the body [1, 4].

The results presented in modern scientific works on bodybuilding [7, 8] reflect the vast majority of features of improvement of the training process of sportsmen in youth and mature age. The main physiological mechanisms of manifestation of adaptation and compensatory reactions of this age under conditions of loading modes of different volume and intensity were revealed [2, 3]. The peculiarities of the muscle mass growth due to the predominant hypertrophy of fast contractile muscle fibers in sportsmen depending on the peculiarities of the load regimes using morpho-functional, biochemical, and physiological methods were also established [3, 5, 6]. Similar studies have not been conducted with adolescent athletes who are actively involved in bodybuilding. Moreover, there has been no research related to the study of effective mechanisms of load regime correction aimed at increasing the functional capabilities of the organism and the level of training in adolescent athletes.

Thus, the problem of determining the optimal variation of physical activity components based on using a wide range of physiological and biochemical methods of control over the processes of adaptation in adolescent bodybuilders remains unresolved.

The purpose of the study. To study the main mechanisms of workload correction in modern bodybuilding for training adolescents taking into account their age and physiological features of adaptation.

Material and methods of the research. To achieve the purpose of the study a complex of integral modern research methods of analysis, systematization, generalization, and processing of information sources was used. The following databases were used: Scopus, Web of Science, and PubMed. 78 articles on this scientific and practical topic were analyzed and 8 were selected as the most relevant to the conducted research.

Results of the study. The conducted analysis of scientific works of leading specialists in bodybuilding [3, 5, 8] who study the correction of load modes, testifies to a large number of contradictory results. First of all, it concerns the value of indicators of the volume and intensity of loads that should be used by athletes at different stages of training depending on their level of training and functional capabilities [1, 7]. However, experts do not always take into account the physiological processes of adaptative body changes while developing models of

training loads, not to mention all the age-related features of compensatory reactions. This primarily concerns the reserves of creatine phosphate and muscle glycogen, which are the main energy substrates in the anaerobic mechanism of energy supply of muscle activity in bodybuilding [1, 8].

The lack of assessment of the nature of adaptation and compensatory reactions to a physical stimulus under conditions of different modes of loading, using a wide range of biochemical methods of control, complicates the process of load correction [2, 3, 7]. The results of the analysis of several works in bodybuilding related to the control of adaptation processes indicate different natures of changes in biochemical blood parameters in young and mature athletes [4, 5]. It should be noted that representatives of these age groups used almost identical modes of power loads during training. This data indicates that the level of accumulation of adaptive body reserves and the processes of energy saving in the same conditions will probably be different. We have not found any research where adolescent bodybuilders took part.

One of the problems of functional control in bodybuilding is the fact that in athletes of different age groups, the duration of muscle contraction and the level of load used during the anaerobic-alactate or anaerobic-glycolytic mechanism of energy supply will differ significantly [7, 9]. These changes are associated with age-related features of the neuroregulatory system, the number of simultaneously active motor muscle units during muscle contraction in agonists, synergists, and stabilizer muscle groups. At the same time, an important factor is the time limits of the sequence of anaerobic substrates involved for the required level of energy supply of motor activity [3, 5]. These features should be taken into account when developing a model of a training regimen that will influence the expressed processes of hypertrophy or the maximum strength growth in adolescent athletes. Moreover, certain parameters of the main indicators of load (projectile working mass, duration of muscle tension, number of repetitions and sets, etc.) should also be included in the developed model.

Conclusion. One of the main problems in adolescence is the destabilization of the neurohumoral system and its influence on the processes of long-term adaptation of athletes to different volume and intensity power loads. To solve the problem associated with the development of optimal loading regimes aimed at accelerated muscle mass growth and maximum strength indicators in adolescent athletes, a large number of controversial issues must be solved by scientists. The problem of using a complex of diagnostic methods for athletes of this age group to assess the nature of adaptation and compensatory reactions under different loads for their correction should be also solved.

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PATTERNS OF CHANGES IN INDICATORS OF SPECIAL PHYSICAL TRAINING OF ATHLETES IN MIXED MARTIAL ARTS

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