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Improving the training process of highly skilled bodybuilders in the preparatory period, general preparatory phase

Abstract. Purpose: to improve the method of training highly skilled bodybuilders during the general preparatory phase. **Material and Methods:** the study involved eight highly skilled athletes, members of the team of Ukraine on bodybuilding. **Results:** comparative characteristics of the most commonly used methods of training process in bodybuilding. Developed and substantiated the optimal method of training highly skilled bodybuilders during the general preparatory phase of the preparatory period, which can increase body weight through muscle athletes component. **Conclusions:** based on studies, recommended the optimum method of training highly skilled bodybuilders depending on mezotsykles and microcycles general preparatory phase.

Keywords: general preparatory stage training process, qualified bodybuilder, muscular component, the optimum method.

Introduction. Bodybuilding – is a rather young sport which quickly develops. The main researches were always aimed at providing requirements of “classical” sport a basis of which is more training of qualities of sportsmen, and an accumulation of muscular weight was considered as an addition to the development of these qualities [1; 2]. Therefore still there is no evidence-based technique of training for a set of muscular weight, coaches and sportsmen should look for an optimum technique by trials and errors [6].

The analysis of native and foreign special literature showed that many works are devoted to training programs of management of a muscular component of a body weight (V. M. Platonov, M. M. Bulatova; V. G. Oleshko; V. V. Usichenko, V. Yu. Jim, A. V. Samsonova, Joe and Ben Weiders, Mike and Ray Mentsers, Artur Jones but other [1–10]).

For today the scientific concept of long-term training of sportsmen is created: from beginners to masters of sports of international class – as the only process which submits to certain regularities of a difficult specific system of training with inherent to it features and ways of a development (V. M. Platonov; L. P. Matveyev; V. V. Mulik) [1; 12; 13].

An accumulation of muscular volumes by an application of general exercises which are carried out at slow speed with a big encumbrance and rather small amount of repetitions in attempt is a main objective of the preparatory period lasting 8 months at a one-cycle planning of an annual preparation. A necessary condition of rational preparation at bodybuilding is a renewal of operability of muscular groups between training classes. Therefore exercises are used in one class which promotes the development of two – three muscular groups. It is revealed that it is enough two intensive classes for a week for one group of muscles for the maximum adaptive reaction. The increase in quantity of loading can become an excess stress for muscular and nervous systems because it is necessary not less than 48 hours for a recovery reaction after the implementation of intense programs [1].

At a selection of exercises for classes in the preparatory period it is necessary to be guided by general exercises which put into work large muscular volumes. Exercises have to be different and provide a harmonious development of all parts of a body, and resistance – is rather big, rate of performance – slow, number of repetitions in each exercise is rather small. Pauses between approaches are rather big – two minutes that provides a renewal of the working capacity.

When planning the program it is necessary to use widely methodical techniques which increase the efficiency of exercises concerning a set of muscular weight.

The amount of encumbrance – is 70–90% of the most available. The number of repetitions fluctuates in the range from 4 to 12. The range of 6-8 repetitions is most often used [1; 2].

The general-preparatory stage of the preparatory period (duration of 20 weeks) includes two drawing and three basic mesocycles in preparation of qualified bodybuilders in two-cycle planning. The basic mesocycle provides a creation of conditions for the subsequent hard work connected directly with accumulation of muscular volumes and improvement of a relief of muscles [7].

Communication of the research with scientific programs, plans, subjects. The scientific research is executed by a subject of the Built plan of the research work in the sphere of physical culture and sport for 2011-2015 by a subject 3.7 “Methodological and organizationally methodical bases of definition of an individual norm of a physical condition of a person” (number of the state registration is 0111U000192).

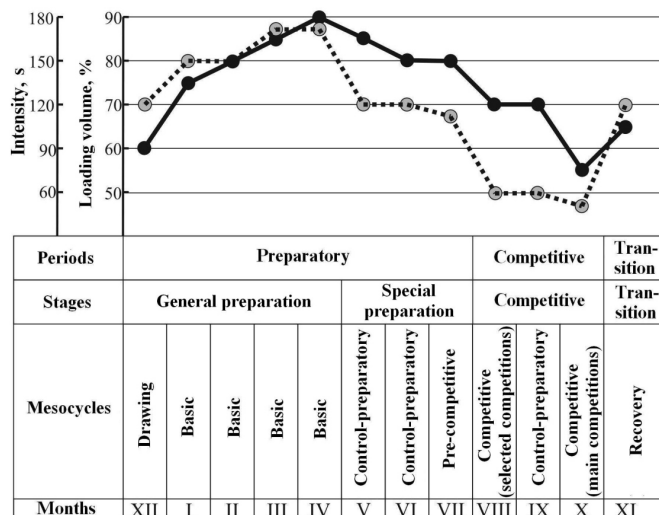
The objective of the research: the improvement of a technique of training of highly skilled bodybuilders in the general-preparatory stage.

Materials and methods of the research. Research methods: theoretical method and generalization of literature, pedagogical supervision, pedagogical experiment, method of mathematical statistics. **Materials of the researches:** 8 highly skilled bodybuilders took part in this research – members of a national team of Ukraine.

Among them are 6 masters of sports and two masters of sports of international class of Ukraine. The age of sportsmen is 25-31 years old. The body weight of sportsmen makes: 85 ± 2 – 105 ± 2 kg. Participants were distributed on two groups – control and experimental on four sportsmen of identical sports qualification in everyone (1 MSIC and 3 MSU). Participants of the experiment trained 4–5 times for a week.

Results of the research and their discussion. The feature of the training process of highly skilled bodybuilders is caused by that the one-cycle system of a planning in an annual macrocycle (pic. 1) was applied to preparation of bodybuilders of high-class. Thus, a training technique was developed in the preparatory period of the general-preparatory stage with an application of two options of training techniques which differed in loading and volume of training exercises,

rest and intensity. The assessment is carried out by means of diaries of training in which a quantity and volumes of a training work were specified.



Pic. 1. Scheme of the one-cycle planning of an annual preparation of highly skilled bodybuilders: — loading volume, intensity of loading

The efficiency of preparation was estimated by means of a method of expert evaluations which provided an application of information concerning the implementation of instructions of a coach, by the dynamics of power and endurance indicators, dynamics of anthropometrical changes, pulse and arterial pressure were measured that allows defining a functional condition of an organism.

Sportsmen of the control group during the experiment had two drawing mesocycles and three basic. Drawing mesocycles consisted of four microcycles everyone, two of which were extending, and two recoveries. Basic mesocycles consisted of one drawing, impact and recovery microcycles (tab. 1).

Sportsmen of the experimental group had one drawing and four basic mesocycles. The drawing mesocycle had three drawing and one impact microcycles. Basic mesocycles had the following scheme: impact microcycle – recovery – drawing – impact (tab. 2)

Sportsmen of the experimental group during the basic mesocycle had three drawing microcycles that promotes a gradual preparation for impact loadings. As the general -preparatory stage in the scheme of one-cycle preparation after the competitive period, during the transition period sportsmen increase the caloric content of a diet and the amount of carbohydrates, it is necessary to increase gradually encumbrances as the sharp increase in loading can lead to a trauma.

For the development of muscular volumes we investigated in scientific literature factors in a percentage ratio which influence the volume of muscular fibers:

- Capillarization – 3–5%.
- Sarcoplasm – 20–30%.
- Myofibrils – 20–30%.
- Mitochondrions – 15–25%.
- Connecting tissue - 2-3%.
- Glycogen - 2-5%.

The periodization of the basic mesocycle was constructed so that to increase muscular volume at the expense of myofibrils and sarcoplasm hypertrophy.

Mechanical damages of muscular fibers and connecting tissue are the main reason for pain in muscles. They appear in 8–12 hours, reach a maximum in 24–72 hours, and pass in 5–12 days depending on the extent of damages and speed of renewal of sportsmen [7; 14].

J. Neumann with coauthors (in 1984) showed that 16% of fibers had a small damage, 16% – strong, 8% – very strong after a highly intensive training. After eccentric exercises the amount of the damaged fibers was made by 52% in three

Table 1
Scheme of the general -preparatory stage of the control group

Stage	Mesocycle	Microcycle
General -preparatory	Drawing	Dr Dr Dr Re
	Drawing	Dr Dr Dr Re
	Basic	Dr Im Im Re
	Basic	Im Re Im Im
	Basic	Re Im Im Im

Note. Microcycles: Dr – drawing, Im – impact, Re – recovery.

Table 2
Scheme of the general -preparatory stage of the experimental group

Stage	Mesocycle	Microcycle
General -preparatory	Drawing	Dr Dr Dr Im
	Basic	Re Dr Im Re
	Basic	Dr Im Re Dr
	Basic	Im Re Dr Im
	Basic	Re Dr Im Re

Note. Microcycles: Dr – drawing, Im – impact, Re – recovery.

days. Damages of muscular fibers and myofibrils cause the regeneration of muscular fabric [7]. The phase of super-compensation comes after the renewal of muscular fibers when organism increases the volume of albuminous structures of muscles.

The process of renewal of muscles proceeds heterochromatically. So, the phase of super-compensation of keratin-phosphate is reached in a few minutes rest after loading which leads to essential decrease in its level. The achievement of the expressed super-compensation of the maintenance of glycogen in muscles requires not less than 2-3 days, by this moment the level of keratin-phosphate will already enter a phase of the lost super-compensation. The bigger period of time will be required, about 12-14 days during which the glycogen level in muscles can already return to day off for renewal of structures of the cages destroyed during trainings [11].

The training process of bodybuilders of the experimental group was based so that the structure of cages and the level of a glycogen were in the phase super-compensation during the impact microcycle. These objectives were achieved the next way: sportsmen worked in a zone of the maximum and submaximum power in the impact microcycle, characteristics of this operating mode is a destruction of myofibrils, accumulation of products of disintegration, and a big tension of functioning of many systems of an organism in the operating time. The work is performed on the verge of operability of CNS and the motive device; at the most available speed of training on indicators of respiratory and cardiovascular systems. The work proceeds in the conditions of considerable shifts in the internal environment of an organism decrease of pH blood. The work proceeds in the conditions of relatives to anaerobic. The concentration of lactic acid grows in 15-20 times and reaches 200–280 mg on 100 ml of blood. During the impact microcycle sportsmen of the experimental group used the eccentric method of performance of exercises on the lagging behind muscular groups that promoted a bigger destruction of myofibrils and more expressed subsequent super-compensation. During the recovery microcycle intensity decreased and training volume increased, a task of this microcycle was not in defiance of a structural component of muscles to reduce quantity of glycogen in muscles for the subsequent super-compensation in the impact microcycle. Sportsmen of the experimental group used the method “pamping” for the solution of this task.

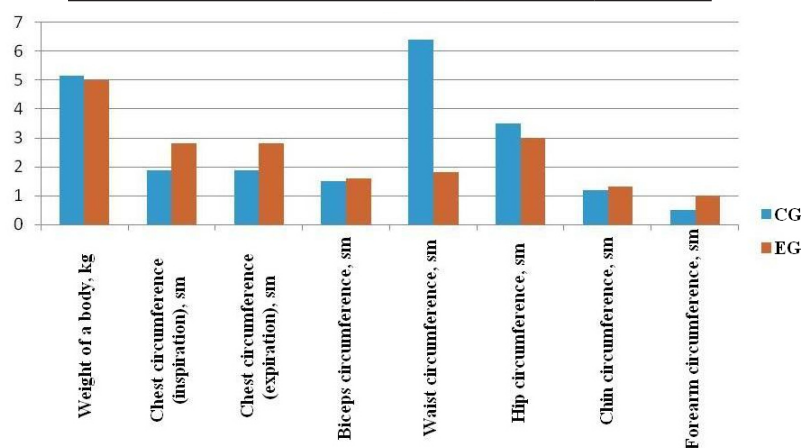
«Pamping» – is a training technique which purpose of application is the increase of a rush of blood to working muscles, and also obstacles to blood outflow from them. An indispensable condition of «pamping» training is the high number of repetitions in one attempt and a large number of attempts on group of muscles. Blood which is «injected» in muscles, stretches fascias, does them by more elastic that in turn promotes the creation of new space for growth of fibers. Strengthening of a blood-groove in muscles promotes the increase in delivery of nutrients, vitamins, and hormones that promotes faster renewal of muscles. Sportsmen trained during this microcycle in the range from 15 to 25 repetitions in an approach, rest made 30–45 seconds. Encumbrance is 30-50% from the maximum.

During the drawing mesocycle the bodybuilders worked by a standard technique, four exercises for big muscular groups, three for the small. In each exercise there are 3-4 attempts on 8-12 repetitions, rest is 1,5-2 minutes between attempts.

Table 3

Indicator of a gain of anthropometrical data of highly skilled bodybuilders throughout the general-preparatory stage

Indicators	CG	EG
Weight of a body, kg	5,17±0,25	4,99±0,2
Chest circumference (inspiration), sm	1,87±0,2	2,8±0,16
Chest circumference (expiration), sm	1,87±0,2	2,8±0,16
Biceps circumference, sm	1,5±0,07	1,6±0,08
Waist circumference, sm	6,4±0,2	1,8±0,2
Hip circumference, sm	3,5±0,17	3,0±0,12
Chin circumference, sm	1,2±0,1	1,3±0,1
Forearm circumference, sm	0,5±0,1	1±0,1



Pic. 2. The comparative diagram of a gain of anthropometrical data of highly skilled bodybuilders of the control and experimental groups at the end of the preparatory period of the basic stage

The Harvard steppe-test was used for an assessment of a functional condition of sportsmen. Sportsmen of both groups within 5 minutes rose by the steppe-platform 50 sm high. The rate of performance of the exercise – is 30 rises and descents for a minute. After the performance of the exercise pulse is measured for 30 s, pulse is measured on the 2nd, 3rd, 4th minutes of updating.

Index of HST= $t \times 100 / (f_1 + f_2 + f_3)$, where f_1 ; f_2 ; f_3 – is data of measurement of pulse on the 2nd, 3rd, 4th minutes of rest, and t – is the time of implementation of the test.

Table 4
Result of Harvard steppe-test

Participants of the experiment	Category	t, time in seconds	f1	f2	f3	IHST
Control group						
1	MSIC	300	83	77	72	64,65517
2	MS	300	80	75	68	67,26457
3	MS	300	82	75	70	66,0793
4	MS	300	80	73	69	67,89163
Experimental group						
1	MSIC	300	62	54	51	89,82036
2	MS	300	70	65	60	76,92308
3	MS	300	80	70	65	69,76744
4	MS	300	72	70	65	72,46377

Note. Indicators of Harvard steppe-test: <55 – is bad physical fitness, 55–64 – below an average, 65–79 the average level, 80–89 – the average level, >90 – excellent preparation.

At the end of the general-preparatory stage of the preparatory period at sportsmen of the control group the gain on 5,17 kg of body weight, increases in the volume of biceps, on 1,5 sm, hips – on 3,5 sm, breasts – on 1,87 sm, shins – on 1,2 sm, a forearm – on 0,5 sm was observed, the volume of a waist increased by 6,4 sm. Sportsmen of the experimental group increased body weight by 4,99 kg, biceps volume – by 1,6 sm, breasts – by 2,8 sm, hips – by 3 sm, shins – by 1,3 sm, a forearm – by 1 sm, the circle of a waist increased by 1,8 sm. By the results of Harvard steppe-test, sportsmen of the experimental group renewed quicker and had the best functional state.

Conclusions. Thus, the conducted research concerning the improvement of the training process of highly skilled bodybuilders allowed establishing that the effect was more expressed and the level of preparedness can be estimated as the most optimum in the EG. The offered technique of the improvement of the training process significantly reduces probability of the formation of adverse shifts of a functional condition of sportsmen (overstrains, overtraining, injuries), allows to reach the necessary level of sportswear without overstrain of adaptation and compensatory mechanisms. This technique allows bodybuilders of high qualification to gain muscular weight and to improve proportions. The body weight of sportsmen increased at the expense of muscular hypertrophy, but not at the expense of fatty layers. The advanced technique of training for highly skilled bodybuilders at the general-preparatory stage of the preparatory period can be recommended for preparation of bodybuilders for the observance of requirements of sports and medical control.

The subsequent researches have to contain the development and foundation of the training process of highly skilled bodybuilders in the specially-preparatory stage of the preparatory period of preparation.

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