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Perfection of the special preparation of volleyball players

Abstract. Purpose: *to develop and apply the complex of exercises for perfection of the special physical preparation of volleyball players and its constituents: special quickness, force, endurance.* ***Material and Methods:*** *sportsmen (candidates in sport masters, I and II digits) inspected in age from 16 to 23 in an amount 40 persons; the special quickness and its constituents are probed: latent period of the reaction, the speed of individual movements; maximum force in various modes; endurance – speed, hopping, power.* ***Results:*** *at drawing on the offered complex of exercises the improvement of indexes of speed and endurance hopping, speed-power capabilities is marked at stimulation of tension of muscles in the conditions of development of a maximum of dynamic effort.* ***Conclusions:*** *terms and methods are certain for the effective conducting of training process, which provides optimum intercommunication of levels of bodily and functional conditions, technical and tactical preparation.*
Keywords: special quickness, force, jumping ability, endurance, training process.

Introduction. In modern volleyball a sportsman needs good physical background, mobility, jumping ability, rapid reaction, orientation on a ground and non-standard coordination. The high level of development of motive qualities allows to promote technically and tactic trade and enables to maintain the playing loading and tension of the protracted match. Implementation of most technical receptions in volleyball requires the display of the special force, foremost maximal and explosion, in different correlations, therefore its perfection is directed on the increase of speed-power capabilities. The optimum level of the sportsman special endurance, necessary in the conditions of concrete competition activity, is characterized the complex display of separate physical qualities and capabilities, its determining. Volleyball belongs to the types of sport, which require the maximal displays of speed and power capabilities in different playing situations during a game [3, 4, 6, 7].

Functional features, promoting implementation of motive actions in minimum time, characterize the speed opportunities of organism. Latent time ordinal reactions often exceeds by time of action of alarm irritants in sporting activity of volleyball player, therefore a sportsman is irresponsive on a type stand reactions in reply to nascent signals auditory, visual, haptic, proprioceptive or mixed character. The expedient and effective reactions of sportsmen, in particular in sporting games, can be explained implementation of operating under the type of anticipation that is not on appearance of some irritant, but guessing at times or began space or appearance of signal for the actions, anticipating a moment and scene competitor or partner [2, 9, 10].

Implementation of most technical receptions in volleyball is characterized by the display of the special quickness at which separate motions and movements will be realized with maximum speed. These forms of quickness in different combinations and in an aggregate with other motive qualities and technical receptions provide the complex display of speed capabilities in training and competition activity of volleyball players [6]. However, added elementary forms of quickness badly are perfection, and only at its complex display considerable progress is marked as a result of the special training [5].

Maximal force mainly depends on the level of development of separate muscle groups of volleyball players. Explosive force characterizes the capacity of muscles for the display of considerable tensions in minimum time.

It was marked at comparison of indexes of relative muscle force of right and left side of body of volleyball players, that force of muscles of «working» side exceeded force of muscles of other side. At single reduction of muscles and display of maximal efforts in work from 30 to 60% muscle fibres usually participate. Special training of the locally-directed affecting those muscles which participate in one or another technical reception or action, it is possible considerably to increase activity of muscle fibres of separate muscles, and also to promote co-ordination of work of muscle groups [7, 8, 11].

Realization of motive preparation is based on a extra-coordinated action in combination with exactness of reacting on a locomotive object. The aggregate of signs, specific at implementation of different actions – attacking shots, blocking, second transmissions and other serves as a signal, determining beginning of motion [1, 10].

Endurance is determined by a capacity for effective implementation of technical and tactic actions, high level of muscle activity, counteraction the process of fatigue development. It is quality and his conforming to the requirements of concrete type of sport and determined by power potential of sportsman organism. In muscle activity endurance is determined plenty of factors. On the basis of the use of numerous signs the different types of endurance are determined, the specific of development of which in the certain type of sport is characterized factors, limiting the level of their display in competition activity, and requirements to the regulator and executive organs [2, 8].

One of methods of perfection of the special endurance is implementation of certain part of the trainings loadings in the conditions of the hidden fatigue. Forming of the special endurance must be oriented on providing of maintenance of the set modes of motive activity, but not on a fight against a fatigue and based on making of abilities to diminish feelings of fatigue by means of decline of power executable labour costs, saving a rational sporting technique and necessary speed mode of motions [1, 3].

At complex perfection by speed, power, jumping and other types of endurance riches a high level of the special preparedness of volleyball players [2, 4, 6].

A purpose of work is development and application of a complex of exercises for improving the training process of

training of volleyball players and the development of special physical qualities : special quickness , strength, endurance .

Materials and research methods. The sportsmen of different age groups and sporting qualification are inspected: 16-18 years – 2 digit, 25 persons, 19-23 – 1 digit and candidates in sport masters, 15 persons. The data were processed by methods of variation statistics.

Perfection of the special quickness was conducted different methods, namely the differentiated affecting its separate constituents and system preparation, uniting local abilities in integral motive acts. The maximum quickness of separate motions was determined at the different starting accelerations of players, including.

Training of maximal force was executed during work of overcoming and yielding character in dynamic and in the isokinectic modes, in a volume 20–30% general physical loading, and also static exercises, not exceedings 10%, were utilized in all the volume of work, directed on perfection of the special force. On overcoming work expended in 2 times faster, that on yielding. Optimum is a rate at which every motion is executed after 1,5–2,5 sec. The amount of reiterations hesitates from 2–3 to 6, duration them – from 5 with and to 30 with in motions, near to the technical receptions of volleyball. Pauses recreation between separate exercises depend on the quickness of renewal of capacity, and amount of reiterations – from character of task and method of training of maximal force.

In jumping exercises for development of speed endurance the methods imitation and playing exercises repeated, interval and competition were used with a ball. Duration of one series of exercises – 15–30 with at maximal intensity, with the interval of rest – 1–2 min, amount of reiterations in one employment – 4–6 or to appearance of fatigue at the end of every motive cycle.

Research Results its discussion. Development of the special physical preparedness depends on sporting qualification and implementation of trainings tasks to on the strictly certain differentiated method.

The special physical preparation promotes functional possibilities of organism, and also perfects motive qualities, necessary for playing volleyball. The fixed assets of trainings employments are exercises, identical on the motive structure and character of nerves and muscle efforts with motions, inherent competition activity of volleyball players.

Speed of reaction will be realized in ability of volleyball players maximally quickly to estimate the created situation, namely to understand intentions and actions of partners and competitors at a change a playing situation, in determination of direction of flight of ball and to accept the most rational decision, passing a competitor. Implementation of technical receptions and tactical co-operations takes a place in a maximally rapid rate at continuously changing playing situations, requiring the display of reaction on a locomotive ball, repeated starting accelerations at blocking or attacking shots.

An average indexes of starting reaction and time of run of separate segments of distance, i.e. the special quickness, are improved with the in-plant training. Latent response time of sportsman in a group 16-18 years – 0,52±0,04 sec, and at a 19-23 summer – 0,39±0,031 sec, i.e. on 0,13 sec faster (reliability $p<0,05$). At the run of distance in 3 м, 6 м, 9 м, the same tendency is marked, for first-grade sportsmen and candidates in masters of sport time is better, accordingly, on 0,02; 0,03; 0,05 sec.

For development of the special quickness it is recommended to utilize the methods repeated, interval and competition.

With the development of explosive force it is necessary to pay a regard to total tension all of participating afoot muscles basic work of which is overcoming dynamic. Exercises are executed in maximum or approximate rate, separate exercises proceed to the decline of capacity. Duration of intervals of rest 1–3 minutes must provide relative renewal of functionality of volleyball player and depends on trained and qualification of sportsman. The amount of reiterations in employment is related to character of exercises, their volume.

Volleyball players have muscles-extensors of shoulder, flexors of foot and extensors of thigh the leading groups of muscles. Athletes higher qualifications compared with 2 volleyball discharge takes advantage in relative force all of muscle groups, except for flexors of shin, thigh and trunk, that, accordingly, makes is a brush: bending is 0,36–0,31 kg, unbending is 0,26–0,23 kg; forearm: bending is 0,37–0,34 kg, unbending is 0,28–0,26 kg; shoulder: bending is 0,38–0,36 kg, unbending is 0,67–0,66 kg; shin: bending is 0,21–0,21 kg, unbending is 0,77–0,72 kg; thigh: bending is 0,34–0,36 kg, unbending is 1,91–1,71 kg; trunk: bending is 0,59–0,62 kg, unbending is 2,04–1,91 kg (reliability $p<0,05$).

The technique of implementation of attacking blow is associate with the followings indexes of level of development of physical qualities of volleyball player: by force extension of shin, thigh and trunk; by total force of more than twenty muscle groups, jumping; by adroitness (by co-ordinating capabilities); by the quickness of starting reaction and quickness of run of segment 3 м. The level of development of physical qualities of volleyball sports master candidates, and first-grade is characterized the followings indexes: total relative force of extensor of shin is equal 1,54±0,18 kg, extensors of thigh – 3,81±0,38 kg, extensors of trunk – 2,04±0,18 kg; a height of standing broad jump is 79,0±7,5 cm; latent period of reaction – 0,39±0,06 sec; the run of segment 3 м – 0,64±0,07 sec (reliability $p<0,05$).

More than third of all of playing actions of volleyball players, related to blocking, attacking shots, second transmissions, executed in a high jump, ability is therefore needed it is correct and highly to jump. The specific of implementation of jumping motions are terms of hard limit of time for understanding of playing situation and making decisions.

The player of attack must co-ordinate all of parameters of jump with actions connective, with character of his transmission. Similar tasks decide blocking players, determining a moment began motion and bearing-out of hands above a net. In the process of pushing away a volleyball player must be able to subordinate the height of jump of the proper tactical situation. For volleyball players the height of serve of ball above a net makes on the average 50 cm and time to the blow at short transmissions – 0,3 sec, time of pushing away – 0,21 sec; at a middle on a height transmission – about 60 cm, time to the blow – 0,5 sec, time of pushing away – 0,32 sec; at a high transmission – 75 cm, repulsion time – 1,1 sec and 0,39 sec. With the increase of height of serve of ball above a net only on 10 cm increased time of pushing away on 0,12 sec and time to the blow on 0,2 sec; at the increase of height of transmission yet on 15 cm time of repulsion rises on 0,17 sec and time to the blow – on 0,6 sec (reliability $p<0,05$). Features of tactical situation cause biomechanics expedience of

jumping actions. Forming for the volleyball players a motive model, proper the expected situations, is one of main tasks of perfection of ability to manage jumping actions in the constantly changing terms of game.

Requirements to the special jumping for volleyball players are especially great, it is conditioned by force muscles of feet and by the quickness of muscles reduction. Depending on character of working as of locomotor apparatus the basic most typical form of power displays for volleyball players there is explosive force muscle strength of lower extremities. However, if muscles work slowly and at permanent tension, equal to mass of burdening, i.e. in the isometric mode, it does not develop their ability to be quickly and dynamically abbreviated.

Perfecting the special jumping, volleyball players apply burdening of less mass. Work of muscles, at jumping out with a barbell by mass 60 kg on shoulders, is characteristic dynamic a maximum of force. Exercises with the large burdening increase power potential of muscles, and with small perfect a capacity for rapid implementation of motion. However much application of these facilities does not decide the problem of development of explosive force which requires the specific moments of full training. The increase of specific constituents of explosive motion is needed – quickness of muscle transition to the active state and switching from yielding work to overcoming.

The stroke method of development of explosive force and reactive ability of muscles is more perspective, which stimulates a shock stretch in muscles, by an antecedent to active effort. It is necessary to utilize not burdening, but kinetic energy of body, accumulated them at the free falling from a certain height. For the best use of muscle energy expediently in the beginning considerably to wrick the fibres of muscle and here give them more kinetic energy, and in reverse motion actively to shorten a muscle.

For perfection of the special jumping broad jumps are utilized with overjumps in height, an optimum height is determined preparedness of volleyball player. Orientation it must be equal 70% from the maximal height of jump of sportsman with the space. Landing is necessary on the forehand of foot, in the moment of touch initial position must correspond beginning of pushing away at jumps in volleyball, i.e. squat not must be considerable, but the subsequent pushing away needs to be executed quickly, with an energetic flap hands. It is necessary to begin jumps with a small height, gradually taking it to optimum.

Speed endurance is needed at implementation of technical receptions and movements with high speed during all game.

Jumping endurance shows up in frequent implementation of jumping actions with maximal muscle efforts at attacking shots, blocking, second transmissions. For its development those methods are utilized, as well as at training of speed endurance, and also circular variants of loadings. Duration of series of jumps – 1–3 min (without the pauses of rest between jumps), amount of reiterations – 5–8, interval of rest between them – 1–4 min, which is due to the level of functional training and qualifications of sportsman.

Power endurance is perfected by the special exercises, allowing to produce the promoted requirements to the muscles, to bearings the basic loading in playing activity of volleyball players. It is exercises, close to an external and internal structure with technical receptions. The basic mode of operations of muscles is dynamic character, namely overcoming in combination with yielding. Exercises (in an insignificant volume), executable in the static mode, are also utilized. Size of burdening – 40–60% from accessible one, rate – from moderate to close to maximal. Execution of separate exercise time is in the dynamic mode of muscles operations – to the considerable fatigue, in the static mode – 10–30 sec, pauses between the series of exercises 30–90 s, the amount of reiterations does not exceed 10–12.

Intensification of playing activity of volleyball players is conditioned by the growth of speed of attacks, improvement of economic feasibilities of players at the maximal quickness of actions. Physical qualities, that are necessary for the successful conduction of a game, are characterized by playing endurance which is perfected in the process of conducting of games with plenty of parties (5–7) complete compositions. Effective conducting of games is the way in the diminished compositions (4Ч4, 3Ч3, 2Ч2), games on time, and also the use in the process of game of exercises of different training influence under reaching a certain account or in interruptions between batches.

For the correct construction of process of perfection of trade of volleyball players has a necessity of intercommunication of physical and technical and tactical preparation, their rational combination. One of criteria there must be accordance of the applied exercises technical and tactical actions at a selection and estimation of facilities of the special physical training.

Conclusions. The quickness of concrete motion is provided mainly due to adaptation of motor apparatus to the set terms of decision of motive task and capture rational muscle co-ordination for the valuable use of individual possibilities of the neuromuscular system.

To stimulate muscle tension can be applied exercises in which external mechanical stimulus is not so much the mass of weights as the energy stored in free fall. Advantages of such method of stimulation of muscular tension are in that he provides a quick growth of a maximum of dynamic effort considerably anymore, what in other cases, which are arrived at without the use of the additional burdening. Switching of muscles from yielding work to overcoming takes a place very quickly, here considerable potential of tension of muscles and absence of the additional burdening of body provide more powerful work of muscles in the phase of pushing away and high speed of their reduction.

At perfection of special endurance (high-speed, jumping, power) and other physical qualities, necessary for implementation of attacking shots, it is necessary to spare the special attention development of force of разгибателей of shin, thighs and trunks, to jumping, coordinating capabilities (especially in unsupported position), starting reaction, quickness of overcoming of short segments.

A set of exercises used to improve of the special physical abilities, must provide optimum interconnection of level of body and functional condition, and also technical and tactical preparation in their rational combination, that enables to decide the tasks of training process effectively.

Prospects of further researches. The analysis of factors, determining the display of the special sportsmen training,

will allow to pick up the most effective method, providing conforming to the specific requirements of training and competition activity of volleyball players in a sufficient degree.

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