

SPECIAL SPEED-POWER TRAINING AS THE BASIS OF TECHNICAL SKILLFULNESS IMPROVEMENT IN SPORT AEROBIC

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Abstract. *Purpose:* to theoretically work out and experimentally substantiate effectiveness of authors' methodic of speed-power qualities' training in sport aerobic. *Material:* 20 sportsmen participated in the research: boys and girls of 8-12 years' age. Assessment of speed-power fitness was conducted by results of commonly accepted tests, applied in sport practice. *Results:* we have developed complexes of jump exercises, which envisage varying of conditions of exercises' fulfillment at the account of pushing conditions (jumps in depth, jumps over obstacles and jumps on elevated platforms). When fulfilling jumps in motion the main was achievement of maximal height with fixing of jump's form in flight. *Conclusions:* we offer six complexes of exercises for speed-power training in sport aerobic. These complexes are recommended to be fulfilled at the end of preparatory part of training session during 15–20 minutes.

Key words: aerobic, speed, power, training.

Introduction

As kind of sports, sport aerobic has been formed and constantly improved for many years. Analysis of competition programs and compositions' content of recent years showed that arsenal of this kind of sports contains push ups, pressing ups, turns, splits, waving, and combinations of aerobic choreographic movements [3–5, 11, and 12, 16–20].

Jumps are one of the brightest elements in sport aerobic and, at the same time, one of the most difficult exercises. Ability to correctly fulfill jumps to large extent determines sportsmen's skillfulness. It can be assumed that quantity of jumps in competition compositions can increase and sportsmen's exercises will become more various [1; 9, 13, 14].

High requirements to jumps' fulfillment in sports aerobic dictate demand in working out of appropriate methodic of their perfection. Unfortunately in scientific-methodic literature on sport aerobic there have not been clear recommendations on jumps' improvement. It is usually mentioned that they shall be fulfilled "beautifully", with extreme height and fixing of jump's form in flight. Also, it is noted that sportsmen's physical condition shall be at high level [3–5, 11, 12, 21–25].

Scientific researches have proved [1, 9, 13, 14], that with fulfillment of any complex jump all actions are concentrated in pushing up phase. In this phase sportsman's speed-power qualities are manifested to the fullest extent. Therefore low level of speed-power qualities will retard improvement of jumps' technique. Thus, methodic of training of these qualities in sport aerobic needs careful review and scientific substantiation.

Purpose, tasks of the work, materials and methods

The purpose of the work is to theoretically work out and experimentally substantiate effectiveness of authors' methodic of speed-power qualities' training in sport aerobic.

The tasks of the research:

1. To work out complexes of jump exercises for training of sportsmen's speed-power qualities (sportsmen's practicing sport aerobic).
2. To experimentally substantiate effectiveness of the offered methodic.

Material and methods of the research: for solution of the set tasks we used complex of research methods: pedagogic methods (analysis and generalization of scientific research literature data, pedagogic observation, pedagogic testing); methods of mathematical statistic.

The researches were conducted on the base of CJSS № 13 in Kharkov. In experimental part 20 sportsmen participated; boys and girls of 8-12 years' age. Pedagogic experiment with participation of two groups of sportsmen (control, n=10; main, n=10) was being carried out during year. Control group was trained by traditional methodic.

The trainings included jumps from choreographic positions, jumps of different structural groups, skipping. Main group fulfilled work by volume and intensity adequate to work of control group. This work included special jump exercises and techniques, which permitted to purposefully train and improve jump ability by authors' methodic.

We offer six specially worked out, theoretically substantiated and tested complexes of exercises for speed-power qualities in sport aerobic. These complexes are recommended to be fulfilled at the end of preparatory part of training session, when 15-20 minutes are assigned for jumps.

Complexes №1, №2 and №3 consist of special auxiliary jumps and main jumps of different structural groups.

Special auxiliary jumps are complexes of four-six easy jump combinations. These jumps prepare legs' muscles for definite working mode of different pushes. The main in their fulfillment is condition of the so-called in practice "quick retreat", i.e. very quick strong push off. Every combination shall be repeated two-three times.

Jumps of different structural groups are fulfilled with weight, equal to 3–4% from own weight. Such weight does not violate the structure of main exercise. With it effect of combined interaction of physical and technical fitness is achieved. When fulfilling these jumps the main is achievement of maximal height with fixation of jump form in flight. It can be achieved with the help of visible bench marks. They can be lamps, windows, mirrors, specially drawn lines on walls, suspended subjects and so on.

Complexes №4, №5 and №6 consist of jump exercises of special speed-power orientation. They shall be fulfilled at the end of main part of training session during 15-20 minutes.

The presented complexes stipulate varying of conditions of exercises' fulfillment at the account of changes of push off conditions (jumps in depth, jumps over obstacles and jumps on elevated platforms). Effectiveness of jumps in depth, followed by high jump, was showed in special researches. Jumps in depth were chosen also because they are exercises of special speed-power training. It is connected with the fact that in most cases pushing off in sport aerobic jumps is usually fulfilled after jump or pounce. Effectiveness of jumps over obstacles and on elevated platform also has been proved in many researches. Such jumps facilitate tension of hip and knee joints' extensors and ankle joint's flexors [2, 6, 7, 13, and 14].

Fulfillment of recommended complexes does not increase total time of training, does not change its structure and does not exceed usual quantity of jumps at training. It permits to increase effectiveness of training process.

For assessment of technical fitness dynamic and level we chose the following control exercises:

1. Jump with changing of legs in front
C832 – (scissors kick) value 0.2 points;
2. From sagittal balance jump in lying position, on hands
C222 – (sagittal scale airborne to push up) value 0.2 points;
3. Jump with turn by 360°
C103 – (air turn) value 0.3 points;
Tuck jump to split
C273 – (tuck jump to split) value 0.3 points;
4. Pike jump
C434 – (pike jump) value 0.3 points;
5. Straddle jump
C553 – (straddle jump) value 0.3 points;
6. Split leap
C673 – (split leap) value 0.3 points;
Switch split leap
C754 – (switch split leap) value 0.4 points;
7. ½ turn Cossack jump
C344 – (½ turn Cossack jump) value 0.4 points;
8. *C645 – ½ turn frontal split jump to frontal split, value 0.5 points;*

The tasks for determination of technical fitness level were selected and composed on the base of sport literature analysis and specificities of sport aerobic [8, 10–12, 15].

Assessment of speed-power fitness was realized by results of commonly accepted tests, applied in sport practice [8, 10, and 15]:

1. Long jump from the spot (cm);
2. High jump from the spot (cm);
3. Squatting during 20 sec. (times);
4. High jumps bending from deep squat during 20 sec. (times);
5. Torso rising in sitting position from lying position during 20 sec. (times);
6. Alternate legs' kicks during 20 sec. (times);
7. Run on the spot during 5 sec. (times);
8. Jumps on one leg during 10 sec. (times);
9. Legs' rising in hanging position during 10 sec. (times);
10. Torso rising from lying position (face downwards) during 10 sec. (times);

Results of research

Testing results showed that realization of authors' methodic influences positively on sportsmen's technical fitness.

During experiment we observed in main group improvement of indicators: "torso rising in sitting position" (increment 14.2%), "run on the spot 5 sec." (increment 13.08%), "alternate legs' kicks" (increment 11.8%), "squatting" (increment 10.41%). Especially it is necessary to stress that dynamic of these indicators' progressing was uniform from the beginning and to the end of experiment by all indicators. It witnesses about correct and effective choice of training means and methods for this kind of sports (see table 1).

Table 1. Changes in speed-power and technical fitness in main and control groups ($p < 0,05$)

№	Tests	Main group (n=10)				Control group (n=10)				
		ID*	FD	abs.	%	ID*	FD	abs.	%	
		$(\bar{X} \pm m)$				$(\bar{X} \pm m)$				
<i>Speed-power fitness</i>										
1	Long jump from the spot (cm)	156±0,4	163±0,3	7	4,2	157±0,6	160±0,5	7	4,2	
2	High jump from the spot (cm)	22,7±0,8	25,2±0,6	2,5	9,9	23,2±0,9	24,8±0,5	1,6	6,4	
3	Squatting for 20 sec. (times)	25,8±0,9	28,8±0,7	3	10,41	25,5±0,7	27,9±0,5	2,4	8,6	
4	High jumps bending from deep squat during 20 sec. (times)	18,3±1,1	20,2±0,9	1,9	9,4	18,0±1,4	19,8±1,1	1,8	9,0	
5	Torso rising in sitting position from lying position during 20 sec. (times)	15,7±1,5	18,3±1,0	2,6	14,2	15,5±1,8	18,5±1,7	2,0	10,8	
6	Alternate legs' kicks during 20 sec. (times)	13,4±0,9	15,2±0,7	1,8	11,8	13,3±0,8	15,0±0,5	1,7	11,3	
7	Run on the spot, 5sec. (times)	16,6±0,7	19,1±0,4	2,5	13,08	16,7±0,9	18,9±0,6	2,2	11,6	
8	Jumps on one leg during 10 sec. (times)	4,0±1,6	4,6±1,2	0,6	13,8	3,7±1,8	4,0±1,3	0,3	7,5	
9	Legs' rising in hanging position during 10 sec. (times)	3,3±1,9	3,6±1,6	0,3	8,3	3,2±1,8	3,4±1,7	0,2	5,8	
10	Torso rising from lying position (face downwards) during 10 sec. (times)	12,4±0,9	14,2±0,6	1,8	12,67	12,5±0,8	14,0±0,8	1,5	10,7	
<i>Technical fitness</i>										
11	Scissors kick	0,17±1,0	0,19±0,7	0,02	10,5	0,18±1,2	0,2±0,9	0,02	10,0	
12	Sagittal scale airborne to push up №3	0,17±2,1	0,2±1,9	0,03	10,0	0,14±1,9	0,15±1,8	0,01	6,6	
13	Jump with turn by 360°	0,28±1,4	0,29±1,0	0,02	6,6	0,28±1,3	0,29±1,1	0,01	3,44	
14	Tuck jump to split	0,26±1,2	0,29±0,8	0,03	10,34	0,25±0,9	0,27±0,7	0,02	7,4	
15	Pike jump	0,15±1,1	0,17±1,0	0,02	11,7	0,14±1,6	0,14±1,4	0,00	0,00	
16	Pike jump, bending, legs apart (points)	0,18±1,6	0,21±1,2	0,03	14,2	0,15±1,8	0,16±1,5	0,01	6,25	

17	Jump in split with push by one leg (points)	0,2±1,0	0,23±0,7	0,03	13,04	0,2±0,9	0,21±0,8	0,01	4,8
18	Switch split leap (points)	0,12±2,1	0,1±1,9	0,01	7,7	0,11±2,2	0,11±2,0	0,00	0,00
19	½ turn Cossack jump (points)	0,3±1,7	0,31±1,5	0,02	6,25	0,3±1,9	0,31±1,6	0,01	3,22
20	½ turn frontal split jump to frontal split (points)	0,2±2,6	0,21±2,3	0,01	4,76	0,2±2,8	0,21±2,5	0,01	4,7

*Notes: ID – initial data (taken at the beginning of experiment);

FD – final data (taken at the end of experiment);

(abs.) – absolute difference; (%) – increment of indicators.

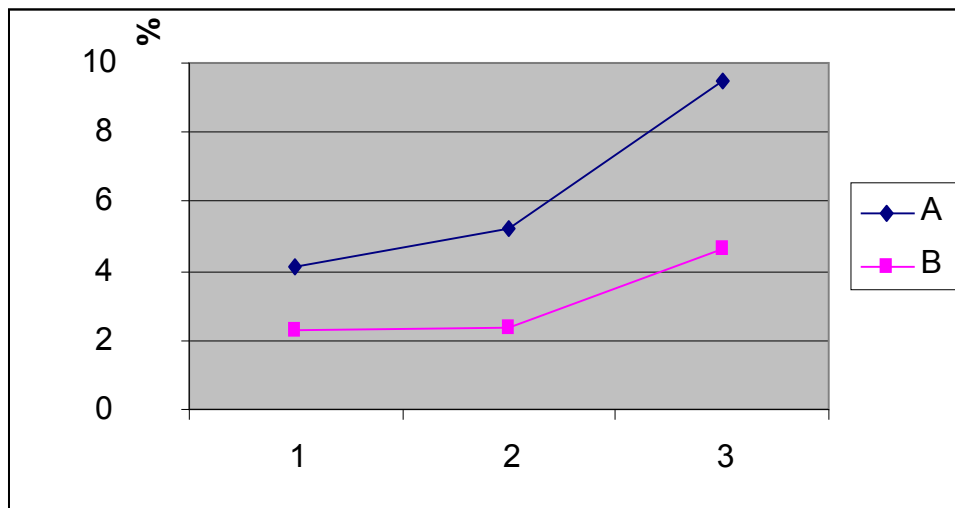


Fig.1. Dynamic of increment of technical fitness indicators in main and control groups: A – main group; B – control group; % – increment in %.

In fig. 1 we give dynamic of trainees' technical fitness indicators (sport aerobic) in main and control groups.

Change of integral indicators by tested technical fitness indicators in two groups' witnesses about positive tendencies in main group sportsmen's technical fitness. By the end of first control testing (after 6 months) increment of technical fitness indicators in main group was: 3.87%, by the end of second half of year – 6.89% and for all period of experiment – 10.76%.

As far as integral indicator in control group concerns it was: 4.64%;' after 6 months of trainings - 2.31% and after second half of year – 2.33%. It witnesses about uniform growth of sportsmanship and insignificant changes in this group, comparing with main group.

Comparing of initial and final data witnesses about effective influence of offered by us experimental methodic on technical fitness indicators of main group sportsmen.

Discussion

Analysis of scientific-methodic literature showed a number of works, devoted to training of speed-power qualities of sportsmen [1, 2, 6, 9, and 13]. Basing on analysis and generalization of our research's results we supplemented and expanded the data of other authors [3–5, 11–14, 26–28] about choosing of means and methods for improvement speed-power qualities as well as about dosing of load in sport aerobic training process.

For the first time we developed complexes of jump exercises for development of sportsmen's speed-power qualities in sport aerobic, which stipulate varying exercises' fulfillment at the accounts of changes of push off conditions. We worked out and experimentally substantiated methodic of speed-power training in sport aerobic, which ensured higher rates of increment of sportsmen's technical fitness.

Conclusion

We developed complexes of jump exercises for development of sportsmen's speed-power qualities in sport aerobic, which stipulate varying exercises' fulfillment at the accounts of changes of push off conditions (jumps in

depth, jumps over obstacles and jumps on elevated platform). Application of these complexes permitted to increase effectiveness of training process and trainees' sportsmanship without increasing of total time of training, without change of its structure and without increasing usual quantity of jumps in training session.

Application of authors' methodic of speed-power training in sport aerobic ensured higher rates of increment of sportsmen's technical fitness.

In the future our researches will be oriented on working out of multi media programs for perfection of jumps' technique in sport aerobic.

Acknowledgements

The research has been fulfilled in compliance with topic of combined plan of scientific research work in sphere of physical culture and sports of MES of Ukraine for 2011–2015 in frames of topic 2.2.4. "Perfection of control mechanisms of sportsmen's motor functioning".

Conflict of interests

The authors declare that there is no conflict of interests.

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Cite this article as: Moshenska T.V., Bodrenkova I.A.
 Special speed-power training as the basis of technical
 skillfulness improvement in sport aerobic. *Pedagogics,
 psychology, medical-biological problems of physical training
 and sports*, 2015;12:67–73.
<http://dx.doi.org/10.15561/18189172.2015.1210>

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Received: 18.08.2015

Accepted: 27.08.2015; Published: 10.09.2015