STUDY OF SPEED ENDURANCE MIDDLE DISTANCE RUNNERS

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Annotation. *Purpose*: To investigate the boost performance speed endurance runners who specialize in middle-distance running. *Material and methods*: The study involved team members Vinnytsia region in an amount of 44 people, whose average age was 20,2 ± 2,1 years. Classes are held during the 21-day mesocycle, 5 times a week, twice a day. Things were aimed at enhancing the development of indicators of special speed endurance. *Results*: The dynamics of the running speed of the model segments that characterize speed endurance athletes. Proved that the improved running 400 meter intervals helps reduce travel time competitive distance of 1500 meters. *Conclusion*: The use of the program contributes to higher speed endurance, which determines the result in the women's 1,500 meters.
Keywords: runners, middle distance, speed endurance, development.

Introduction

It is known that insufficient endurance restricts human possibilities in every day and, especially, in sport functioning, in choosing of profession, efficiency of work. In theory and methodic of physical education endurance is regarded as ability to execute work with certain intensity during long period of time, overcoming resistance of both external environment and internal medium [4].

Before developing of special endurance it is necessary to achieve high level of aerobic and anaerobic energy supply mechanisms as well as sportsmen's power potential. It creates pre-conditions of maximal mobilization of organism's functional abilities in conditions of specific loads [3, 2, 5]. In this context the most important for runners are speed endurance [6, 7]. Speed endurance is ability to execute dynamic work of maximal intensity for long time. Rather effective mean of speed endurance's training at stations of "circle" training id shuttle run with gradual increasing of segments' length as well as different temp and jump exercises [4, 8, 9].

Profound study of factors, which determine specific influence of endurance in different kinds of sports results in need in studying of special endurance, considering ways and mechanisms of energy supply, mental phenomena, muscular fibers, which participate in work, in natural interconnection with technical-tactic capabilities of sportsmen [7, 1, 10-15]. Just owing to this fact pedagogic aspect of the problem of runners', specializing in middle distance run, speed endurance training is especially urgent.

The research has been carried out as per plan of scientific & research works 2.24 "Improvement of training and competition functioning's effectiveness of qualified sportsmen with permitted means of recreation and stimulation of workability", state registration number 0111U001731, of combined plan of scientific & research works in sphere of physical culture and sports of Ministry of education and science, youth and sports of Ukraine for 2011-2015.

Purpose, tasks of the work, material and methods

The purpose of the work is analysis of dynamics of middle distance runners' speed endurance's development. For achievement of our purpose we should have solved the following tasks: determine indicators of middle distance runners' speed endurance; carry out comparative analysis of speed endurance's indicators in dynamic of 21 days' meso-cycle.

The methods of the research: theoretical analysis and generalization of literature sources, devoted to training of middle distance runners; pedagogic testing was fulfilled in order to determine the level of sportsmen's speed endurance; pedagogic experiment lasted during April and May 2011. Experiment involved members of track and field combined team of Vinnitska region, who specialized in middle distance run, 44 persons of average age of 20.2 ± 2,1 years. Sport qualification of participants of pedagogic experiment is as following: CMS -20, 1st sport grade – 24 persons; period of sport training – from 5 to 7 years. The researches were carried out in dynamic of 21 days' meso-cycle in structure of special-training stage of preparatory period.

Training process in this period was oriented on development of special, to be more exact speed endurance, which was evaluated in control test [(2×400)×2 series] by F. P. Suslov [5]. Rest interval between series was 12 minutes and between runs – 1 minute. Running of competition distance 1500 meters sportsmen fulfilled in 2-3 days after control testing. Researches were carried out in three stages: at the beginning, at the end of 21 days' mezzo-cycle and after finishing of competition season.

For evaluation of speed endurance's indicators we analyzed effectiveness of competition functioning at championship of Vinnitska region with registration of time of 1500 meters distance passing.

During processing of statistical data we calculated mean arithmetic ($\overline{X}$), mean square deviation (S). For comparing of differences' confidence we used Stjudent's criterion (t), when distribution of sample corresponded to normal law that was checked up by X^2–criterion of Pirson. When distribution of sample did not correspond to normal law of distribution, we used non-parametrical criterion of Mana-Witny. Level of reliability was set as P = 95% (probability of error 5 %, i.e. level of significance was p=0,05).

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Results of the research

For determination of speed endurance's indicators of middle distance runners, we carried out control testing [(2×400 m)×2series] with further running of 1500 meters' distance. In dynamics of changes of model segments passing's indicators we did not notice confidently significant changes ($p > 0.05$). At the same time at all stages of research we registered increment of results: for example in second series of first run mean time of segments' passing at first stage was 62.75±1.23 sec., at second stage it was 62.29±0.97 sec., at third – 61.87±0.80 sec.

Comparing of indicator Δ, which reflects difference of changes of every separate parameter of physical fitness, points at similar trend of changes of the researched parameters at different stages of training; that is why increment of results between first and second stages was 0.44 sec.; when comparing 1st and 3rd stages – 0.88 sec. accordingly. These data point at the fact that training process was built correctly both theoretically and practically.

The same situation took place with analyzing of speed in all runs. It is proved also by results, showed by sportsmen in competition distance of 1500 meters. For example, analyzing indicators of 1500 meters' run we noted that at the beginning of 21 days' meso-cycle time of distance's passing was 241.61±5.32 sec. At the end of 21 days' mezo-cycle this indicator did not exceed 240.33±4.69 sec. while after finishing of competition season it was 239.17±3.96 sec. For example, one of the tested sportsmen, who had qualification 1st sport grade, Andriy K., showed time of distance's passing at the beginning of the research 250 sec., at the end of meso-cycle - 244 sec. and after finishing of competition season– 243 sec. CMS Oleksandr M. had results 248 sec., 246 sec. and 234 sec. accordingly.

During all period of researches we registered clear trend for improvement of 1500 meters' run results, though we did not revealed any statistically significant changes. In our opinion it is explained by rather high level of tested sportsmen's fitness and coach's setting for distance running at certain temp.

Considering of "distribution of forces" is rather important in middle distance run. That is why in our research we studied changes of time of 400 meters' model segments' running on all three stages of the research (see fig.1). The obtained data witness that improvement of middle distance running's results was accompanied by increment of speed endurance indicators of middle distance runners during all period of the research.

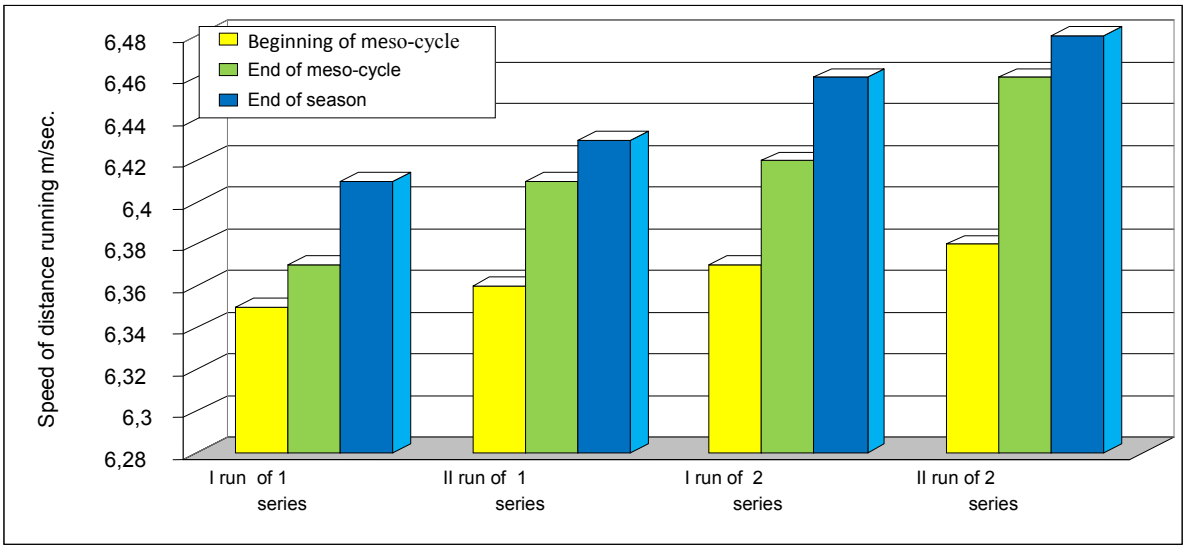

Fig.1. Dynamic of development of middle distance runners' speed endurance indicators

Analyzing indicators of 400 meters' segments running we can affirm that with every running at all three stages of the research results showed trend to increasing (see fig.1). At the beginning of meso-cycle in 1st run, 1st series, speed of running was 6. 35 m×sec.$^{-1}$, after finishing of meso-cycle speed of 1st run ,in 1st series became 6.41 m×sec.$^{-1}$, though we did not stated no statistically confident differences between these indicators in dynamic of meso-cycle ($p > 0.05$), we noticed only clear trend to it. The same situation we observed in dynamics of running speed of 2nd run, 1st series.

Indicators of speed endurance in 2nd run, 2nd series have clearly expressed increasing growing character. If at the beginning of meso-cycle mean speed of 400 meters' run was 6.38 m×sec.$^{-1}$ that was the best result in that meso-cycle, then, after finishing of meso-cycle we observed noticeable trend of increasing of 400 meters' run indicator. After finishing of meso-cycle this indicator was 6.46 m×sec.$^{-1}$ that exceeds significantly the similar value at the beginning of meso-cycle; at the end of competition season it reached 6.48 m×sec.$^{-1}$.

Besides, analysis of competition functioning's results showed that all participants of the research improved their personal results at distance 1500 meters, i.e. correctly constructed training process is accompanied by increment of running speed of middle distance runners that adequately is reflected in results of testing. Such testing is rather associated with results of running of competition distance and can be used for prognostication of competition results.

Conclusions:

1. Increment of speed endurance indicators of runners, specializing in middle distance is accompanied by increasing of competition functioning's results.
2. The best results of 400 meters runs was observed in second run of 2nd series that says about high functional fitness of sportsmen and correct fulfillment of coach's instructions by sportsmen.
3. Results of loads in test [(2×400 m)×2series] are rather adequate reflection of results of competition distance's control running.

The prospects of further researches imply determination of dynamics of speed endurance indicators of sportsmen of different qualification and usage of permitted pharmacological means for influencing on increasing of speed endurance.

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