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TECHNOLOGY OF TRIPLE JUMP RHYTHM OPTIMIZATION IN THE TRAINING OF TRACK AND FIELD ATHLETES

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Abstract

The rhythmic structure of the basic phases of the triple jump, the problem of the optimal ratio of the length of "stabbing", "stepping" and "jumping" are in the focus of experts during the development of the theory and methodology of this type of jumping. In this case, the optimal ratio of the length of the phases is different in different periods, it changes from year to year in the direction of the increase of the last phase of the triple jump.

Keywords

triple jump, from the "percussive" style of techniques, world records.

In the 50s of the last century, when the world record belonged to the Brazilian da Silva, the optimal ratio of the length of the jump phases, which other jumpers tried to match, was equal to 70+30+32(%). In the 1970s, when Viktor Saneyev, the former All-Union champion, was dominant, experts considered the ratio 37+29+34 (%) to be the optimal rhythm. However, with the victories of D. Edwards (Great Britain) and M. Conley (USA) in the 90s, the ratio changed to 35+28+37(%). (Table 1) 15.58 m of the world record. from (M. Oda, Japan, 1931) 18.29 m. (D.Edwards, Great Britain, 1995) due to growth, the change in the ratio is associated with a change in rhythm, in which the percentage of "jumping" increases from 31 to 37%, and the percentage of "stabbing" level from 41 35% reduction was determined. Thus, as the percentage of the last part of the triple jump increases, the jumping technique changes from "priority jab" to "priority jump".

The change in men's triple jump techniques was reflected in the ratio of triple jump phases during the entire development of this type: from the "percussive" method

(38-31-31%) through the "increasing" method

(37-30-33% via "mecomet" method

We observe similar tendencies of changes in the rhythmic structure of the triple jump with the increase of the result in women's triple jump. It started with the performance of female athletes from the relatively recent era of jumping, or from the 1993 World Championships. The last phase of productivity growth is associated with "increased length and decreased "stabbing" length."

In addition, in the triple jump, the length of the first and second phases tends to converge. The indicator that reflects this trend is the size of the difference in the length of the "stabbing" and

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"stepping" phases. This parameter is reduced from 1.1 m in male jumpers. As the qualification of female triple jumpers increases, this indicator decreases by almost 2 times (from 1.60 m to 0.82 m).

One of the aspects of improving the efficiency of movements in horizontal jumps is the reduction of extremely high impact loads. By reducing the "stab" trajectory, jumpers reduce the impact-vertical loads in the second step of the triple jump. This decrease in phase length is compensated for by increasing the horizontal speed across the jump and the "step + jump" dependence. This allows, firstly, to slightly reduce the volume of basic strength training, and secondly, to reduce the probability of injury, thereby increasing the duration of the period of participation in big sports. A similar situation is observed in high jumps: in the 70s, the strong "jumping" style of jumping was replaced by a fast style. This technique also required strength from the athlete to make good use of running speed.

The dynamics of triple jump rhythm with increasing results in female jumpers (top line - "stab", middle - "jump", bottom - "step jump".

High indicators of the variability of the parameters of the special training of ski jumpers confirm that the use of averaged models in managing the training process of ski jumpers at the stage of sports skills is ineffective, it shows the need to create group and individual models of the special training of ski jumpers.

From this point of view, it is very reasonable to divide jumpers into groups by experts. Such a division was made on the basis of one or another priority movement abilities of athletes in the structure of special physical training: strong "syrinter", "strong" jumper", "universal", "syrinter jumper". Also, on the basis of the group features of the technical training structure - "fast", "model" and "high trajectories" groups, and on the basis of the technical method - "riding", "running", "amplitude" and "ricochet" (5). Development of group models and formation of group model bases of preparation based on this is in accordance with the goal. This allows for a more differentiated approach to the training of jumpers, taking into account the individual level of the athlete and the structure of special physical training, which should increase the effectiveness of training.

Experts studying the relationship between the rhythm of the triple jump and the specific physical fitness of the jumpers have found that as the sprinting fitness and running speed of the athletes increases, the ratio of the triple jump level changes towards the increase of the final phase, in which the jumper's "jumpiness" -Strength" ability growth is correlated with the length of the "stab+step" link. Depending on the typology of the jumper ("quick", "universal", "strong"), different rhythms of the triple jump are also recommended.

So, there are 2 drastic ways to solve the action task:

- triple jump with a low trajectory of "stabbing" and "stepping", maintaining horizontal speed throughout the jump and a large combination of "stepping + jumping" ("priority jumping technique");

The upper trajectory of the flight phases of "stabbing" and "stepping" is a triple jump with an emphasis on the length of the "step + jump" link ("priority jump" technique).

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The purpose of the research is to develop a technology for controlling and improving the rhythm of the base-flight phases of the triple jump using the measurement system "OptoJump Next".

Research methodology: "OptoJump Next" is an optical measurement system, which consists of combined transmission and reception packages up to 100 m long. Each meter panel consists of 96 lights that continuously transmit data to the transmitter. The system calculates any intersections at different joints between the panels and their duration, and also determines the intersection of the various joints. It allows to control the parameters of athletes' movements in various physical exercises - execution and length, speed, completion, speed of the exercise with high accuracy.

In experimental studies, the length of the light diode was 30 meters, covering the last 6-7 steps of the sprint and the take-off phases of the triple jump. The parameters (velocity, acceleration, length and speed of running strides, time of the base-flight phases of running steps, time of triple jump dips and base-flight phases) are automatically transferred to the computer after the athlete's attempt, where they are digital and is presented in the form of a drawing.

5 qualified male and female triple jumpers (from SU to HTSU) took part in the research.

During training, control of the ratio of triple jump phases was carried out using the "OptoJump Next" electronic beam device. With its help, the length of the middle phase of the triple jump was automatically determined on the computer monitor immediately after the jump, and the developed calculation program (in Office Excel) calculated the phase ratios in percentages.

When performing special exercises aimed at forming the "priority stabbing" technique of the triple jump, PXK:

- in depressions - strong active depression;

- in the 2nd and 3rd steps, put the foot on the ground in a wide "swinging" movement;

- active touching of the ground during squatting and immediately climbing up.

When performing special exercises aimed at forming the "priority jump" technique of the triple jump, PXK:

- quick depressing is necessary in depressings;

- "running past" the first depsining;

- In squats, move the leg from the side of the pelvis "to the bottom" and put it on the ground with a "sliding" movement;

Pushing from behind with active shaking.

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Individual optimization of the triple jump rhythm is carried out in two stages. At the first stage, the individual structure of special physical training is analyzed on the basis of the developed model descriptions.

Model Specifications of Special Physical Training of Qualified Triple Jumpers (Women) One or another motor skills with priority development in an athlete are distinguished ("fast" or "strong") or, on the contrary, their uniform development is noted based on the ratio of test indicators ("universal"):

- speed training - running for 10 meters while walking (electronic timing) or running for 50 meters along the movement from the start (hand timing)

- strength training

- lifting the barbell to the chest or jumping from the support 3 times with 2 running steps;

- jump preparation - 5 times "stabbing" with 6 running steps

At the second stage, jumpers are offered to make corrections to the rhythm of the base-flying phases of the triple jump with the help of special exercises (3-4 exercises) and the PXK of technical training and adapt it to the individual structure of the athlete's special physical training based on the recommendations.

Conclusions:

1. The development of the triple jump technique and the growth of results in this type of athletics in the world, the optimal ratio of the length of the triple jump phases has changed in the direction of the increase of the "jump" phase due to the decrease of the "stab" phase. One of the aspects of improving the efficiency of movement in horizontal jumps is the reduction of extremely high impact loads in squats.

As the "stab" trajectory is reduced, jumpers reduce the percussive vertical loads in the second step of the triple jump, where they express the "step + jump" link.

2. Examination of the relationship between the rhythm of the triple jump and the special physical fitness of the jumpers showed that with the increase in the sprinting fitness and running speed of the athletes, the ratio of the phases of the triple jump shifts towards the increase of the last phase ("jump" phase). changes, at the same time, the increase of the jumping skills in the jumping players is correlated with the length of the link "stabbing + stepping".

3. The "OrtoJump Next" measurement system allows for rapid biomechanical control of the technical training of triple jumpers during technical training, that is, to determine the ratio of the length of the 3 phases of the triple jump. The length of this measuring system is that the phases are long, and the athlete records the length ratios of the "stabbing", "stepping" and "jumping" phases immediately after completing the length. (in percentages compared to the total length of the triple jump)

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4. The presented technology of optimizing the ratio of the three support-flight phases of the triple jump with the help of special exercises and PXKs based on the use of the electronic beam device "OptoJump Next" allows to adapt the rhythmic structure of the athlete's triple jump to the individual structure of his special physical training.

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