

Research on the Effectiveness of Special Strength Training Methods in Sprint Sports

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Abstract: Strength quality is the most important physical quality of sprinters and the most important part of sprint training. However, at present, China lacks understanding of the macro-training ideas and specific training methods of strength quality, which has already had a serious restrictive effect on the development of China's sprint sports. The special training of athletes' lower limbs has important theoretical significance for the improvement of athletes' training level. Based on the author's learning and practical experience, this work first analyzed the common methods of special strength training for sprinters, then studied the factors that restrict the effectiveness of special strength training of sprint sports, and finally put forward a new strategy to improve the effectiveness of special strength training for sprinters.

1. Introduction

With the improvement of the athletic ability of various countries, the theoretical research of track and field sports has also achieved substantial achievement. Development of track and field sports in China has been particularly rapid in recent years, but from the overall level, there is still a apparent gap with the world-class top level. As a physical-oriented speed project, strength training requires continuous, periodic and rapid training [1]. Therefore, how to improve the ability of muscles to have rapid contraction in the case of encountering certain resistance is the key to strength training. The ultimate goal of developing special forces as the main training content is to transform the speed of power into the speed of action, and ultimately achieve the ability to improve speed. In sprint training, a good special strength training program can benefit sprinters a lot, for example, it can increase the strength of athletes, increase explosive power, increase the frequency of movements, improve the coordination of athletes' body, improve the ability of muscles to use energy, and prevent the occurrence of sports injuries during the process of special items, thereby improving the athletes' athletic performance [2]. The strength training is directly related to the growth and future achievements of sprinters.

2. Common Methods Used for Special Strength Training of Sprinters

The choice of special strength training for sprinters depends on the coach's understanding of the characteristics and technical nature of the modern sprint program. However, from the perspective of the whole training practice, there are still many deficiencies in the methods of sprint special strength training [3]. At the current stage, the special strength training methods for sprint sports can be summarized into three aspects:

Firstly, the barbell weight-bearing training. This training method has undergone a process from prosperous to recession and to activation in the special strength training of the sprint project. This form of strength training maximizes the development of training forces, and its training method is to reasonable arrange specific plans in the annual cycle practice of sprinters, such as high-turning, snatching, jerking and semi-squatting.

Secondly, the means of jumping. This training method is regarded as a special strength training method of sprint in China. This method is generally used for the basic strength training and for special technology transformation. In addition, the jumping training has become a kind of characteristic in the sprints sports training of China. Since the action structure, the muscle

movement, the force mode and the strength characteristics in the jumping activity are similar to those required for the specific strength of the sprint. In the sprint exercise practice in China, the jumping method is generally the single-legged multi-level jump, leapfrog, all kinds of deep jump, back-off jump and stride jump with timekeeping and step counting [4].

Thirdly, the training for local muscles. This method can play a role in supplementing training, and it can also provide supplementary strength training for small muscle groups that are easily overlooked.

3. Factors Limiting the Effectiveness of Special Strength Training in Sprint Sports

3.1 Insufficient understanding for the special strength concept of sprint sports

The special strength refers to the strength that meets the requirements of the special competition in terms of time and space characteristics, and its scope includes the training that meets special technical movement requirements in the aspects of range and speed of movement, the characteristics of force, the way of muscle working, the characteristics of energy supply and the psychological adaptability. In the actual special strength training, people do not have a comprehensive and clear understanding of this concept, and some people still regard the effect of barbell weight-bearing strength training as the special sports effect. This kind of cognitive error will cause the athlete to carry out excessive barbell learning and training, which exceeds the normal range of exercise. As a result, the muscles of the sprinter will gradually become thicker, the muscle fibers will be shortened, and the elasticity and flexibility needed by the muscle will be weakened, therefore, in the process of sprinting, the movements of sprinters will be stiff and tense, which is very unfavorable for the improvement of sports performance. Therefore, the comprehensive analysis of the sports effect should be emphasized in the future special strength training instead of blindly carrying out a certain training [5].

3.2 Special strength training method and sprint special technology do not accord with the requirement of muscle strength

The development of the current sprint sports is mainly characterized by the active landing technique of the hip extension and the swinging form. The progressive training of this technique should be grasped by taking different forms of specialized training. However, in the past period of time, the special strength and technical training of Chinese sprinters adopted a method opposite to this method, that is, to use the technical theory and practical exercises to achieve the enhancement of the rear pedal effect. This practice content emphasizes the knee extension, and pays too much attention to develop the strength of the quadriceps femoris and myelin flexor muscles, resulting in the lack of training and development of the medullary muscle group, and it is a big obstacle for the improvement of scope and speed. One of the main goals of special strength training in sprinting is to increase the step length [6]. However, in actual training, various training methods of Chinese sprinters have not obtained an effective solution strategy for this goal, which shows a lack of specificity in the choice of special strength training methods and the training effectiveness. In addition, from the level of special strength training, paying too much emphasis on rapid strength training and explosive training instead of rapid strength endurance training and explosive endurance exercises is a hindrance for sprinters to improve their speed and endurance.

4. New Strategies to Improve the Effectiveness of Special Strength Training for Sprinters

4.1 Methods and modes of continuously updating special strength training

At present, there are many special strength training means, so it is difficult to evaluate the actual effect of a specific method, but the choice of special strength training means should first meet the characteristics of modern sprint sports technology. On the one hand, the strength training of barbells should stride forward to the direction of specialization. The training of barbells can produce greater stimulation to the nervous and muscular systems and can achieve better effect. Therefore, it only

needs to develop in the direction according with the requirements of special technology in the future, and the main method is to combine the barbell weight-bearing resistance training with the special technology, so as to strengthen the dual training of strength and speed, and promote the power to serve special training [7]. In addition, in the innovation of special strength training, the hip-axis accelerated sports training should be added. Under normal circumstances, the speed acceleration of sprinters mainly depends on the increase of the step frequency, which has a direct relationship with the muscle strength and coordination in the hip joint, that is, the braking and swinging ability. Therefore, it is necessary to strengthen this kind of training in actual training. In addition, the training of concessions and extraordinary strength focusing on metacarpophalangeal joint and ankle joint should be gradually strengthened [8]. This form of training is coordinated with the hip-based training method, which is beneficial to the optimization of technical effects and good performance of mechanical effects for the ground cushioning action in the sprint sports.

4.2 Appropriate load, intensity and means of sprint special strength training

The special strength training in the sprint sports should reflect the characteristic relationship between the dynamics of the special technology itself and the time as well as space as much as possible, so as to improve the athlete's competitive ability [9]. The key of sprint sports is the athlete's stride frequency and acceleration, stride and sustainable capacity, which are mostly accelerated movement. Therefore, in actual training, it is necessary to formulate and select the effective load and strength of strength training. Generally, the maximum strength training uses the load that is slightly lighter than the maximum weight load. It is effective to maintain the training resistance at about 80 percent of the maximum load, and the 6rm value is most suitable [10]. In the actual training, the load should be selected to keep the muscles in an overload state, and the selection of the special strength training methods for sprint sports should mainly follow the principle of pertinence, increase the targeted training for the muscle groups that need special strength, and mainly carry out strength training similar to muscle movements in special activities. For example, it is necessary to strengthen the training methods such as in-situ jumping and weight-bearing jumping in order to train small joint muscle groups.

5. Summary

Although China has made great breakthroughs in the research of sprint strength training, there are still some shortcomings and defects in strength training. The special training methods commonly used by sprinters are barbell training, jumping training, and local or small muscle strength training. Generally, strength training can not exert the same effect as that of special strength training. Therefore, in order to improve the special ability, it is necessary to combine the advantages of strength training and technical movement, and pay full attention to the important role of special strength training. The special strength of Chinese sprinters should firstly update the means and methods of special strength training, and at the same time choose the appropriate load, intensity and means of sprint special strength training.

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