

Effect of High Intensity Basketball on Skeletal Muscle Fatigue in Field Jungle Training

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Abstract:

Field jungle training is a part of field sports. It is competitive and challenging, and puts forward higher requirements for human body function. In the process of modern basketball special technical training, the key is the training of body sensitivity, coordination, balance ability, aerobic endurance, muscle strength and movement speed. In this study, 20 students of basketball specialized class in physical education department were selected as the experimental objects, and the experimental objects were randomly divided into two groups. The two groups were playing high-intensity basketball in the field. The experimental group was intervened by core strength training, and the control group was intervened by traditional strength training. In the early stage, middle stage and late stage of field training, the index test was completed respectively, and the research results of the experimental group and the control group were compared and analyzed. Experimental research shows that: the two forces can not be separated, and no single force can exist. Relatively speaking, core strength training recruits more muscles to participate in, while traditional strength training has stronger pertinence and less muscle participation.

Keywords: Modern basketball, field jungle training, core strength, muscle participation.

I. INTRODUCTION

At present, in the basketball training of sports majors in Colleges and universities, the training of core strength is relatively rare, and most of them adopt some traditional strength training methods [1-2]. The students of physical education department in Colleges and universities only hear about the core strength, but they don't really use it in practice, and they don't know how to practice. In addition, due to the influence of venues and equipment, they can't carry out systematic core strength training [3-4]. So far, the core strength training method

has become more and more mature, has a good development prospect, has been applied to many competitive sports, the actual effect of the core strength training has also been verified, and for basketball this kind of high antagonism, higher requirements for all aspects of the body quality of the movement, the core strength training is essential.

In the process of searching the published literature on the core strength training of basketball, it is found that most of the researches prove the influence on a certain technical field of basketball through the core strength training, and lack of comprehensive research on the overall technology used in basketball [5]. It can only prove the influence of core strength training on a certain aspect of basketball, lack of certain integrity, and can only give some reference value to the outside world [6]. This research mainly through the experimental method, taking 20 students of basketball specialized class in Normal College of physical education as the research object, divided into two groups, 12 weeks of core strength training and traditional strength training [7-8]. Through the analysis of the experimental data to get the final result, reflecting the importance of the two strength training methods in basketball technology, to provide a scientific basis for the development of basketball training and teaching.

II. RESEARCH OBJECTS AND METHODS

2.1 Research objects

This study takes 20 basketball majors in Physical Education Department of Normal University as the research object. Core strength training and traditional strength training methods are the main contents of the research.

2.2 Research method

1) Experimental method

In this study, a control experiment was used to divide 20 junior basketball students into control group and experimental group [9]. The control group received traditional strength training, while the experimental group received core strength training. Each group of 10 people, for 12 weeks of training, training is divided into two stages (basic improvement stage and comprehensive improvement stage).

2) Data processing

After 12 weeks of experimental intervention, the selected indicators were tested three times in the early, middle and late stages of the experiment, and the original data were obtained three times. First of all, the electronic database is established and calculated with Excel to get the required average and standard deviation. And through the calculation formula of slope, the linear slope corresponding to the two stages of 20 people in the experimental group and the control group was calculated. Secondly, the software statistica was used to test the difference by repeated measurement analysis of variance. And input the original data in the software for drawing, and then through the modification of the obtained pictures, get the final experimental

results [10]. Statistica software was used to test the slope of two straight lines in the experimental group and the control group. Finally, the experimental group and the control group will be tested three times all the indicators of the data chart for comparative analysis, draw the final conclusion.

III. RESEARCH RESULTS

3.1 Sprint with ball test

Dribble straight-line sprint, can more accurately reflect the subject's straight-line dribble sprint ability. As shown in the figure, there is a significant difference between the second test and the first test in the experimental group ($P < 0.01$), which is very different, and the time consumption is significantly reduced. There was significant difference between the third test and the first test in the experimental group ($P < 0.01$). There was no significant difference between the third test and the second test in the experimental group. There was significant difference between the second test and the first test in the control group ($P < 0.01$). There was significant difference ($P < 0.01$) between the third time and the first time in the control group. There was no significant difference between the third test and the second test in the control group (as shown in Figure 1 and table 1).

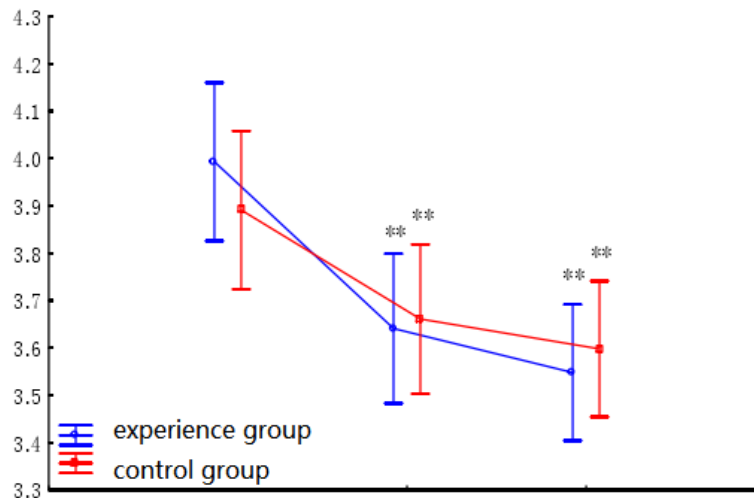


Fig 1: Sprint with ball test results

TABLE I. Sprint with ball test results

TEST ITEMS	GROUPING	FOR THE FIRST TIME	THE SECOND TIME	THIRD TIME
SPRINT WITH BALL	Experimental group (n = 10)	3.99±0.20	3.64±0.22	3.55±0.21

TEST	Control group (n = 10)	3.89±0.30	3.66±0.26	3.60±0.23
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TABLE II. Sprint with ball test slope

TEST ITEMS	GROUPING	SLOPE (FIRST SEGMENT)	SLOPE (SECOND SECTION)
SPRINT WITH BALL TEST	Experimental group (n = 10)	-0.78±0.45	-0.09±0.09
	Control group (n = 10)	-0.82±0.24	-0.10±0.15

There was no significant difference in the first, second and third test between the experimental group and the corresponding control group. However, through the calculation of the slope of the experimental group and the control group, although there is no significant difference in the slope of the first segment between the experimental group and the control group, the slope of the control group is larger than that of the experimental group. Although there is no significant difference in the slope of the second segment between the experimental group and the control group, the slope of the control group is larger than that of the experimental group, and the growth trend of the experimental group is obvious (as shown in Figure 1 and table 2).

3.2 Sprint without ball test

The linear sprint test is used to reflect the ability of subjects to start quickly and accelerate quickly. As shown in the figure, there was a significant difference between the second test and the first test in the experimental group ($P < 0.01$). There was significant difference between the third test and the first test in the experimental group ($P < 0.01$). Compared with the second test, the time of the third test in the experimental group decreased, but there was no significant difference. There was no significant difference between the second and third test and the first test in the control group (as shown in Figure 2 and table 3).

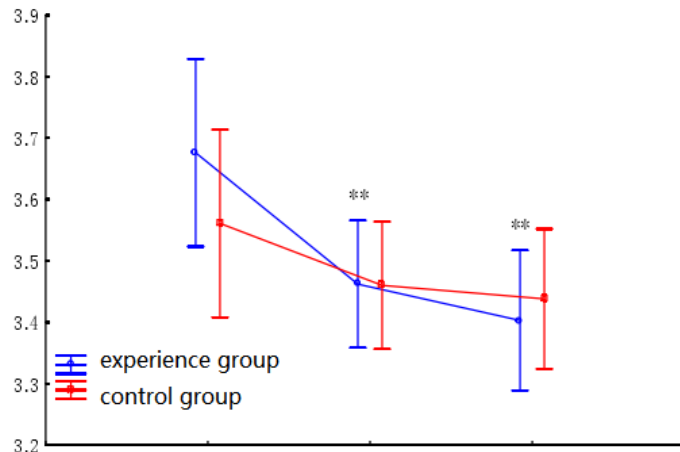


Fig 2: Test results of sprint running without ball

TABLE III. Test results of sprint running without ball

TEST ITEMS	GROUPING	FOR THE FIRST TIME	THE SECOND TIME	THIRD TIME
SPRINT (NO BALL)	Experimental group (n = 10)	3.68±0.29	3.46±0.11	3.40±0.10
	Control group (n = 10)	3.56±0.15	3.46±0.19	3.44±0.22

TABLE IV. Sprint without ball test slope

TEST ITEMS	GROUPING	SLOPE (FIRST SEGMENT)	SLOPE (SECOND SECTION)
SPRINT (NO BALL)	Experimental group (n = 10)	-0.21±0.27	-0.06±0.08
	Control group (n = 10)	-0.10±0.15	-0.02±0.05

There was no significant difference in the first, second and third test between the experimental group and the corresponding control group. However, through the calculation of the slope of the experimental group and the control group, although there is no significant difference between the experimental group and the control group, the slope of the experimental group is larger than that of the control group. Although there was no significant difference in the slope of the second segment between the experimental group and the control group, the slope of the experimental group was larger than that of the control group (Fig. 2 and table 4).

IV. ANALYSIS AND DISCUSSION

4.1 The experimental group and the control group sprint to have the ball

In basketball game, fast attack is a main scoring method. The main problems are fast forward fast attack with ball and fast down taking fast attack without ball sprinting, which requires high requirements for short distance sprint ability and dribble sprinting ability of athletes. After a period of core strength training, the second test was significantly different from the first test before intervention ($P < 0.01$). The test time had a significant decrease trend, and it was obvious that the core strength training played a certain role in a period of time. With the increase of training time, the third test was significantly different from the first test before intervention ($P < 0.01$). The time used in the experimental group decreased significantly, but the decrease of time consumption was less than that in the first stage.

It can be seen that it may take more time to improve on the basis of a certain amount of training. Sprint is a comprehensive project. It is not only a movement of feet and arms, but also a movement that starts with feet. Many muscles of the whole body will participate in it, and dribble will be added, which makes it more difficult to connect skills. Not only the leg muscles, to run faster, for the core area of muscle training is also essential. If the core area muscle is not strong enough, the speed of the dribble sprint will not be too fast, and the movement will be unstable during running. When sprinting, the movement deformation will lead to the lack of support, which will not only affect the speed, but also the muscle is vulnerable to injury.

After a period of traditional strength training, there was a significant difference between the second test and the first test before intervention in the control group ($P < 0.01$). With the increase of training time, there was a significant difference between the third test and the first test before the intervention in the control group ($P < 0.01$). The time used in the control group had a significant decreasing trend, but compared with the first stage, the decreasing range was less. It can be seen that the training of core strength and traditional strength will have an impact on the dribbling sprint. The three tests of the experimental group were compared with those of the corresponding control group, although there was no significant difference. However, through the comparison of the slope of the first and second straight line between the experimental group and the control group, there is no significant difference in the slope of the two straight lines, but the slope of the two sections of the experimental group is smaller than that of the control group, so with the increase of training time, the trend of the control group in dribbling sprint is more obvious. Our common abdominal, lower back and hip muscles provide the stability and power we need for running. It can be seen that core strength training can enhance the stability of dribbling, and has a good effect on the control of movement. Traditional strength training plays an important role in starting and accelerating. Therefore, the two strength training methods are helpful to the dribble sprint ability of the subjects.

4.2 The experimental group and the control group sprint without the ball

Fast start sprint ability is very important in many sports, which can well reflect the fast start ability and acceleration sprint ability of the subjects. The faster the speed of starting and sprinting, the more advantages can be obtained in basketball attack and defense, which is more conducive to the exertion and application of training techniques. When testing the linear acceleration run, the standing start, slight flexion of ankle joint and knee joint and open feet are adopted, which is more in line with the actual situation on the basketball court. After a period of core strength training, there was a significant difference between the second test and the first test before intervention in the experimental group ($P < 0.01$), and the test time was significantly reduced. It was obvious that a period of core strength training played a certain role. With the increase of training time, there was a significant difference between the third test and the first test before the intervention ($P < 0.01$). The time used in the experimental group had a significant decreasing trend, but the decreasing range was smaller than that in the first stage.

Although the starting speed is very important, the speed of acceleration depends on the step frequency and step length, and the role of muscle strength in the core area of sprint can not be underestimated.

Compared with the three tests in the control group, the time used in the three tests tended to decrease, but there was no significant difference. Through the traditional strength training, the strength of the arms, legs and shoulders is increased. When starting, it can quickly push the ground to release the force, and the body center of gravity is quickly transferred to the front sole of the foot. When accelerating, it can drive the body by the rapid back and forth swing of the arms to get faster speed. The three tests of the experimental group were compared with those of the corresponding control group, although there was no significant difference. However, there was no significant difference in the slope of the two straight lines between the experimental group and the control group, but the slope of the two straight lines in the experimental group was greater than that in the control group. Therefore, in the no ball sprint test, with the increase of training time, the decrease trend of experimental group time is more obvious, and with the passage of time, the decrease trend may be greater. Therefore, core strength training and traditional strength training are indispensable in fast running, and play a certain role in a specific technical link. However, after a long period of training, it is obvious that core strength training can improve the performance of short distance accelerated running faster.

V. CONCLUSION

In basketball, two different strength training methods can promote the balance ability of the body, the ability of fast exertion, the sensitivity and coordination of movement, and the number of hits in shooting. Many previous studies have proved that the effect of core strength training is better than that of traditional strength training. But through this study found that not all the test items are the core strength training effect is good, some items of traditional strength training effect is better than the core strength training, strength training time is different, two kinds of strength training play different roles.

In the process of exercise, any technical movement can not leave the core of the body, but without the support of large muscle groups, the muscle strength of the core area can not be fully played. The two forces can not be separated, and no single force can exist. It's just that when doing a certain movement, the number of muscles involved in some parts is different. Relatively speaking, core strength training recruits more muscles to participate in, while traditional strength training has stronger pertinence and less muscle participation.

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