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THE EFFECT OF SHORT-TERM HIGH-DENSITY EXERCISE ON PERFORMANCE AFTER CAFEINE ACTION IN BASKETBALL PLAYERS SUMMARY

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ABSTRACT

This study aimed to determine the effect of short-term high-intensity exercise on performance after basketball intake in basketball players. Method: The study group consisted of 10 female students between the ages of 14-16 who are doing sports in Van Municipality Sports Club. In this study, age, height and weight measurements were taken and 20 meter shuttle run was used to create a short-term exercise in athletes. Participants were measured before and after caffeine supplementation. Pre-test and post-test fatigue were created in the participants. Vertical jump, standing long jump, agility and linear speed tests were taken. SPSS 17.0 package program was used for data analysis. As a result of the analysis, the difference between the five-meter and ten-meter tests between the pre- and post-tests between the groups was statistically significant ($p < 0.05$). Vertical jump, standing long jump, agility and the difference between twenty meters pre and post test were statistically insignificant ($p > 0.05$). While a significant difference was observed between some groups, no significant difference was observed between some groups. This is because caffeine is given only once.
Keywords: Cafein, Basketball, Exercise.

1. INTRODUCTION

Basketball is distinguished from other branches by being a branch that has been developing continuously since the day it was first played, this change first occurred in the number of players and then in the game rules. This process is not only related to the technical and tactical features of the players but also the number of scientific studies about physiological and motoric properties of players has increased and made a contribution to the field (Gencer, Coskun, Sarikaya & Kaplan, 2018). The most commonly consumed caffeine in a cup is approximately 100 mg (Brian, Keisler, Thomas & Armsey, 2006). Reasons for the widespread use of caffeine; caffeine caused by the stimulating effect and staying alert, reducing physical stagnation, improving performance, such as increasing attention, are important factors. Recent studies on caffeine have investigated the effects of caffeine on the central nervous system, as well as on the cardiovascular, respiratory and endocrine systems. Caffeine, especially on the nervous system with the stimulating effect of athletes remain more alert and fit (Hewlett & Smith, 2007). The aim of this study is to determine the effect of short-term high-intensity exercise on performance after basketball players.

2. INDIVIDUALS AND METHOD

2.1. Subjects

The research group consists of 10 girls between the ages of 14-16 who are doing sports in Van Municipality Sports Club. In this study, age, height and weight measurements were taken and 20 meter shuttle run was used to create a short-term exercise in athletes. Participants were measured before and after caffeine supplementation. Pre-test and post-test fatigue were created in the participants. Vertical jump, standing long jump, agility and linear speed tests were taken. SPSS 17.0 package program was used for data analysis.

Short Term Exercise: The workforce that the muscles exhibit during an aerobic activity using maximal and supramaximal energy transfer systems is called 'anaerobic capacity'. The value of the work per unit time is called "anaerobic power". Anaerobic work, with the occurrence of explosive power, is a workload above the anaerobic threshold, but it is a concept that occurs with fatigue (Yildiz, 2012).

Although the importance of anaerobic performance is emphasized in all sports branches in general, it is stated that the importance of anaerobic performance is indisputable in sports branches. In all sports branches known to date; anaerobic performance in football, basketball, handball, ice hockey etc. team sports in defense and sudden attack development, short distance running and short distance swimming branches, wrestling, tennis, skiing, gymnastics are more important than other measurement criteria. Although the importance of anaerobic performance is emphasized in all sports branches in general, it is stated that its importance in sports branches where anaerobic performance is used is indisputable. In all sports branches known to date; anaerobic performance in football, basketball, handball, ice hockey etc. team sports in defense and sudden attack development, short distance running and short distance swimming branches, wrestling, tennis, skiing, gymnastics are more important than other measurement criteria. It is expressed (Ozkan, Koz & Ersoz, 2011).

Body Weight Measurement: Weights and shorts and t-shirts were placed on the scales with their bare feet.

Length Measurement: Meter is used for height measurements. During this measurement, the subjects did not have any clothes on their feet and heads that could change the measurement. Measurements were taken with bare feet.

Age: The age of the athletes was determined as years.

Caffeine Intake: Caffeine daily normal dose range (approximately 50-300 mg) consumption of the person's state of alertness, energy and ability to concentrate in case of excessive consumption (300-800 mg and above) in the person sleep disorder, insomnia, irritability, anxiety, panic attacks and anxiety states. Involuntary contractions may also occur in overdose (Al Moutaery, Al Deeb, Ahmad & Tariq, 2003).

Linear Speed Test (5/10 / 20m): Starting with a tape measure, distances of 5 m, 10 m and 20 m were determined and photocell gates were placed. In addition, a strip placed 0.7 m in front of the photocell gate at the starting point was determined where the subjects would stop at the beginning of the test. The subjects were asked to cover the distance from the starting line to the funnel placed 5 m after the 30 m gates as soon as possible. Subjects started the test at their own time and when they crossed the starting line, the photocell automatically started the time. The transition times of the subjects to 5 m, 10 m, 20 m and 30 m were determined by the photocell. The test was performed in 3 replicates, 3 minutes of rest was allowed between repetitions and the best scores of the subjects were recorded (Green, Blake & Caulfield, 2011).

Vertical Jump: Vertical jump test was used to measure the lower extremity explosive strength of the subjects. A digital Jump Meter (TTK) was used to measure the vertical jump distance of subjects. Before the test, subjects were allowed to experiment sufficiently to reach maximal height. Subjects were asked to stand on the Jump Meter mat for the test. The test was performed in 2 different ways. In one, subjects were allowed to swing their arms and feet and were instructed to jump as far as possible with the double foot. In the other, subjects performed the test with their hands on their waist. After splashing, they have

to land on the mat as a double leg. The test was repeated 3 times, 1 minute rest interval was given between tests and the best grade was recorded in cm (Harman & Garhammer, 2008).

Long Jump Standing: A starting line was drawn on a non-slippery flat surface and a tape measure was placed on the floor forward from the starting line. The subjects stood behind the starting line and the toes of the subjects stood behind the starting line. The subjects were asked to have their arms parallel to the floor and knees, and their knees bent. They were asked to swing as fast as possible by swinging quickly using their arms and legs. The same test was performed with the hands of the subjects. Subjects should descend to the ground on double legs after the jump. Jumping distance of the subjects was determined by measuring the starting line and the distance to the heels at the point where they landed after the jumping. The test was repeated 3 times and the best grade of the subjects was recorded in cm (Harman & Garhammer, 2008).

Agility: T-test was performed to determine the agility performances of the subjects Prior to the test, a starting line (A) was used perpendicular to the starting line (A), 9.14 m from this starting line, and B point at the right and left of the B point. , 57 m away from the C and D points were determined. A funnel was placed at points B, C and D. The photocell start-stop gate was placed on the starting line. To perform the test, the subjects should run from the starting line to the funnel B, touch the funnel B, then go to the funnel C or D, with the side-sliding steps, after the contact with the funnel, go to the funnel D or C on the other side, and again after the funnel C funnel, finally back from the C funnel back to the starting line. The test was repeated 2 times with an interval of at least two minutes and the test completion times of the subjects were considered as their agility performance. A score of better than two trials was recorded (Green et al, 2011).

3. RESULTS

Firstly, descriptive statistics about the age, height and weight of the participants are given in Table 1 below.

Table 1. Demographic Information of Participants

VARIABLES	N	Mean	S.S	Min	Max
AGE	10	15	823	14	16
HEIGHT	10	165	7,3	155	181
WEIGHT	10	51	4,73	45	60

Table 2. Women's Pre-test and Post-test Values

VARIABLES		N	Mean	S.S	T	P
VERTICAL JUMPING	PRE-TEST	10	2,46	170	0,08	0,94
	POST-TEST	10	2,46	123		
LONG JUMPING	PRE-TEST	10	1,86	0,265	1,06	0,32
	POST-TEST	10	1,82	0,241		
AGILITY	PRE-TEST	10	12,07	970	0,03	0,98
	POST-TEST	10	12,07	1,16		
FIVE METERS	PRE-TEST	10	1,56	0,506	2,09	0,05
	POST-TEST	10	1,23	0,101		
TEN METERES	PRE-TEST	10	2,15	165	3,54	0,01
	POST-TEST	10	1,97	166		
TWENTY METERS	PRE-TEST	10	3,69	0,235	1,61	0,14
	POST-TEST	10	3,51	0,452		

When the vertical jump tests of the participants were examined, pre-test means the value was 2.46 and a post-test meanvalue was 2.46, and this difference was found to be statistically insignificant ($p > 0.05$). When the pre-test and post-test of long-standing participants were examined, the averages were 1.86 and 1.82, respectively. This difference was found statistically insignificant ($p > 0.05$). When the agility tests of the participants were examined, the pre-test value was 12.07 and the post-test value was 12.07, and this difference was found to be statistically insignificant ($p > 0.05$). When the five-meter pre and post-tests of the participants were examined, the mean values were 1.56 and 1.23, respectively. This difference was statistically significant ($p < 0.05$). When the pre-test and post-test of the participants were

examined, the mean values were 2.15 and 1.97, respectively. This difference was statistically significant ($p < 0.05$). When the twenty-meter tests of the participants were examined, the pretest value was 3.69 and the post-test value was 3.51. This difference was found statistically insignificant ($p > 0.05$).

4. CONCLUSION

It is reported that caffeine-containing energy drinks improve reaction time, increase aerobic and anaerobic endurance, and reduce the insomnia problem of drivers. There are also studies on the ergogenic effect of caffeine supplementation before moderate intensity training. Moderate caffeine supplementation (~ 75 mg) improves cognitive performance such as attention, reaction time, visual attention, psychomotor speed, memory and alertness (Babu, Church & Lewander, 2008). In a study examining energy expenditure in long-term exercises for 6 weeks, it was observed that subjects who consumed 500 mg / day of caffeine before exercise consumed less energy than subjects who did not receive caffeine. On the other hand, 5 mg / kg caffeine dose and caffeine-free subjects did not find any difference in energy consumption in bicycle exercise. At the same time, 5-10 mg / kg caffeine energy consumption of women who do not exercise regularly during physical exercise significantly increased energy consumption. 9 mg / kg caffeine taken before long-term exercise increased endurance and plasma adrenaline concentration in athletes but did not affect respiratory criteria, lipid destruction and noradrenaline levels. In another study, it was found that caffeine supplementation has an ergogenic effect in aerobic studies of athletes with moderate and high endurance athletes (Goldstein et all, 2010, Cinar, Akbulut & Sarikaya, 2017, Cinar, Akbulut, Kilic, Özdal, & Sarikaya, 2018). In another study; subjects from the anaerobic athletes'group, taking caffeine (5 mg / kg), found a significant increase in power use compared to placebo (Woolf, Bidwell & Carlson, 2008). Studies indicate that caffeine has no significant effect on muscle strength and fatigue in short-term maximal exercises. According to the literature, the main reasons for this difference can be related to experimental design differences, physical performance levels of athletes, exercise duration and severity (Greer, Morales & Coles, 2010; Cinar, Talaghir, Akbulut, Turgut & Sarikaya, 2017).

In another study; studies on female and male footballers have shown that acute creatine intake increases the severity of exercise (such as splash, jogging and agility) for about one week. Despite these significant results, recent studies are suggestingthat acute creatine supplementation has no positive effect on repeated short running capacity in the fatigue and match simulation protocol, but supports that long-term use may have more positive effects on performance (Williams, Abt, Kilding, 2014). Caffeine can contribute to endurance performance by increasing the mobilization of fatty acids, thereby protecting glycogen stores. In addition, caffeine can facilitate calcium transport and affect muscle contraction, as well as reducing fatigue, as well as reducing plasma potassium accumulation associated with fatigue. The ergogenic effect can be achieved with 6.5-7 mg / kg consumption before exercise. There is no positive effect of caffeine consumed before high intensity exercises (Ersoy, 2010). As a result, caffeine intake was found to be effective only on the five meter and ten meter sprint conditions, but there was no change on other tests shortly after caffeine intake and the reason for this was; caffeine intake is thought to be given 1 hour before.

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