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A study on specific workout of badminton players

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Abstract

The purpose of the study was to analyse the specific workout over shuttlers and see that if it was affecting physiologically same as a match affects. Total 10 subjects were purposely selected from the Degree College of Physical Education Amravati. The study was delimited to male players only age ranged 18 to 25 years. The selected dependent variable for the study were Lactic Acid, Heart rate and Breathing rate. Specific workout and match were taken as independent variable. The reading of Lactic acid, Heart rate and Breathing rate were measured and recorded accordingly after match and specific workout. The subjects performed specific work out and match different days. The data for selected physiological variables were collected pre and post specific work out and matches. Capillary blood samples were taken for lactic acid, breathing rate and heart rate were measured manually. The data was analysed through depended t-test at 0.05 level of significance. The findings of the statistical analysis revealed that lactic acid formed post-match (8.43 ± 1.233) and post workout (8.03 ± 1.002), Heart Rate values of post-match (145.70 ± 16.878) and post workout (153.20 ± 24.769) and breathing rate values of post-match (43.60 ± 15.056) and post workout (41.90 ± 16.775) when compared through paired t test then it is found that no significant difference found between the lactic acid ($p > 0.05$), heart rate ($p > 0.05$) and breathing rate ($p > 0.05$). The no significant results (Lac, HR, BR) reveals that the specific workout is implementing similar effect over the badminton players. Through the findings we can say that players apply similar effort in specific test as he used to apply in a match as the specific test brings similar physiological changes in a shuttlers body as a match affects.

Keywords: Specific workout, lactic acid, heart rate, breathing rate, capillary blood samples, shuttlers

Introduction

The science of sports is fascinating to proficient players, and competitors, as well as to anyone with an enthusiasm for the sports, particularly if the sports person plays the game with an aim to excel in the sport and achieve the highest of the pinnacle. It includes many components (Jadaun *et al.*, 2021, Yüksel & Aydos, 2018) ^[2, 11]. Sportsperson must be physiologically sound so that the sportsperson could perform well while playing the game. (Kumar, 2018) ^[4] It is necessary that the physiological needs of the sportsperson who is pursuing badminton as a sport is fulfilled properly so that the player could meet the requirement of the spots and perform well. The physical profile of the sportsperson lays a great impact at the time of deliverance of performance. The physical profile includes the bodily dimension of the human body of the sportsperson (Shipurkar, 2016) ^[9]. Badminton is played all around the world and is popular among the Indian population. Badminton is an only one of its kind and an exceptional sport. It is an idyllic sport and requires great energy while playing the sport. The spots person pursuing badminton as a profession needs to be very energetic and physiologically, anthropometrically, psychologically and physically strong to excel in the sport of badminton. Badminton is a popular sport that is played by all the people belonging to different age groups in all the regions of the country. Badminton is a widely played game all over the country with no restrictions or limitations. Badminton is the game which is played between two players with the help of badminton rackets and shuttle. Badminton can also be played in mixed and doubles of badminton games. The players playing the game must be physically fit and mentally strong with excellent athletic features to score well in the game of the badminton. The body of the sportsperson is highly impacted by the physiological effects which are found to be genitival in nature. The changes in the physiological implications play a big role in the development of the mental status of the human body of the sportsperson (Dias, 1995) ^[1].

The identification of the physiological needs of the person enables the coaches and the trainers to formulate such training sessions for the player which would be helpful for

improving the basic game of the player and help him to take the game to the next levels of performance. (Kumar *et al.*, 2021) ^[5] The physiological needs of the badminton player include body symphony, aerobic aptitude, muscular distinctiveness, pace, litheness, and quickness. (Kumar & Jhajharia, 2019) ^[6] When a correct assessment of the player's physiological needs is done the player is able to perform well and bring about progressive changes in the game mechanics s (Xu, Wang, Ye, Di, Xu, Mo & Jin, 2016) ^[10]. The physical profile determines the different body dimensions that make the sportsperson liable for the sporting activity. The physical attributes are necessary to be taken into consideration as it decides the performance of the sportsperson to a great extent. Each sport has a different body requirement which if the sportsperson has could bring an added advantage to the personality of the sportsperson. The identification of physical parameters characteristic of a sport enables coaches and athletes to design and apply suitable conditioning programmers, which contribute to player's improved performance (Shahril, Jani & Salimin, 2017) ^[8].

Purpose of the study

The main purpose of the study is to find out the physiological changes (Lactic acid, Heartrate, Breathing rate) after specific workout and singles match. Through this study physiological changes are observed and compared

between the two groups.

Hypothesis

On the basis of literatures, discussion with the experts and personal experience it was hypothesized that there might be significant difference in Lactic acid, Heart rate and Breathing rate between the specific workout group and match group.

Methodology

For this study 10 male shuttlers are purposely selected as subjects from Degree College of Physical Education, Amravati who have experience of more than 7 years as a shuttler. The age of the subjects was ranged from 18 to 25 years. Prior data collection the basic details and records of the subjects has been collected like age, weight, height (Table 2). First of all the subjects get introduced about the whole study and the procedure which we were supposed to follow. On day 1 subjects were allowed to play singles match and it was ensured that match must be played between two equivalent players. Pre and post-match data of lactic acid, heart rate and breathing rate was collected. After a gap of 1 week the second shift data collection process was followed. This time the shuttlers were given specific workout (mentioned in table 1) taking all the environment condition same as day 1 the pre and post workout data of lactic acid, heart rate and breathing rate was collected.

Table 1: Specific workout schedule

SET 1 (Total 3 sets will be performed by the subject) There must be interval of 1 min in between every consecutive set	
Choice and Order of Exercise	Sets X Reps / Duration
• On Spot Jump	30 Sec
• Stride	30M X 3
• High Knee	30 Sec
REST 15 Sec	
• Jumping Jacks	30 Sec
• Mountain Climber	30 Sec
• Jumping Squat	30 Sec
REST 15 Sec	
• Tapping / Fast Feet	15 Sec
• Burpee	10 times
REST 15 Sec	
• Footwork 6 Corner Side	30 Sec
REST 15 Sec	
• Multishuttle	30 Sec

Results and Discussion

The data pertaining to each of the selected physiological components i.e. lactic acid, heart rate and breathing rate were examined statistically by dependent t-test (paired t-test) in order to determine the significance difference between workout group and match group. The level of significance to test the hypothesis was set at 0.05.

Table 2: Descriptive statistics of the physical details of the shuttlers

Physical aspects	N	Min	Max	Mean	Std. Deviation
Height	10	152	167	159.25	4.634
Weight	10	49	64	56.583	4.737
Age	10	18	25	21.42	2.353

Through the statistical method the post data of lactic acid, heart rate and breathing rate was compared between workout group and match group. Table 3 shows the values of paired t test. Here we can see that lactic acid formed post-

match (8.43±1.233) and post workout (8.03±1.002), Heart Rate values of post-match (145.70±16.878) and post workout (153.20±24.769) and breathing rate values of post-match (43.60±15.056) and post workout (41.90±16.775) when compared through paired t test then it is found that no significant difference found between the lactic acid ($p>0.05$), heart rate ($p>0.05$) and breathing rate ($p>0.05$).

Table 3: Findings of paired t- test

Variables pairwise comparison	Mean	Std Deviation	Std. Error Mean	t	df	Sig. (2- tailed)
Postmatchlac- Postworkoutlac	6.43 6.03	1.233 1.002	0.390 0.316	1.664	9	0.13*
Postmatch HR- Postworkout HR	145.70 153.20	16.878 24.769	5.337 7.832	1.330	9	0.216*
Postmatch BR- Postmatch BR	43.60 41.90	15.056 16.775	4.761 5.305	1.899	9	0.090*

*No significant difference found at 0.05 level of significance.

Discussion

As we can see from the findings that no statistically significant difference ($p>0.05$) was found between the lactic acid, heart rate and breathing rate values of post-match and post workout (Table 3). P Majumdar *et al.* in their study (1997) [7], “physiological analysis to quantify training load in badminton” showed that as compare to the match high lactate and high heart rate values are found in on court training. As the on training lays more stress on muscular and cardiovascular system. The training load needs appropriate monitoring to avoid overtraining. Workouts that are too intensive may interfere with coordination, a factor that is important in sports requiring highly technical skill such as badminton. Taking the Majumdar’s study as reference the author had planned a specific workout which lays similar physiological effects over the shuttlers. The no significant results (Lac, HR, BR) reveals that the specific workout is implementing similar effect over the badminton players.

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