P-ISSN: 2394-1685
E-ISSN: 2394-1693
Impact Factor (RJIF): 5.38
IJPESH 2022; 9(6): 307-310

www.kheljournal.com
Received: 01-08-2022
Accepted: 03-09-2022

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Analysis of aerobic exercises and ladder training on physical and physiological variables among school level cricket players

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Abstract
The purpose of this study was to determine the effect of aerobic exercises and ladder training on physical and physiological parameters among school level cricket players. Forty-five (45) male cricket players were purposely selected from Government Higher Secondary School Bugam and Government Boys Higher Secondary School Yaripora, of (UT) Jammu and Kashmir. These players have to participate in district level championship. The mean of the players were: (15±0.9 years, height of 168.10±4.15 centimetres, 58.70±3.30 kg were chosen). All the subjects were tested to assess the cardiorespiratory endurance and agility before (pre-test) and after 8-weeks training period (post-test). Cardiorespiratory endurance was assessed by coopers 12 min Run/walk testing. Agility was assessed by Illinois Agility test. The subjects were randomly segregated into three groups; aerobic exercises, (12 exercises for two sessions per week) (ATG-I = 15), ladder training (12 exercises for three sessions per week) (LTG- II= 15), and control group (CG = 15) didn't take part in any special training. Cardiorespiratory endurance and agility was improved significantly in both training groups (p<0.05). Aerobic exercises group was much better than ladder training group in cardiorespiratory endurance and ladder training was much better in agility than aerobic exercises training group. This may be due to the nature of trainings and type of exercises given. It was concluded that cricket game requires fast changes in direction, cardiorespiratory endurance for running, jumps for fielding, forward lunges and much more around the ground. Cricket coaches should include aerobic exercise and ladder training exercises in training programme.

Keywords: Cardiorespiratory endurance, agility, ladder training, aerobic exercise and cricket players

1. Introduction
Cricket is a bat-and-ball sport that is one of the oldest games on the globe. The British Empire's expansion expanded this once colonial recreational pastime to all corners of the globe, transforming it into a spirited game. Cricket appears to be a virtual lifeline for many Commonwealth countries nowadays. Cricket is a sport in which each team is required to bowl and bat according to a set of rules. The winning team is the one that scores the most runs. In the past, the game was known by several names in various nations. Cricket evolved from a simple game in which a piece of wood was used to hit an object. Essentially, it's a duel between the bat and the ball, although the strategy has shifted over time. Test cricket, one day international cricket, first class twenty-20 cricket, super six cricket, eight aside cricket, indoor cricket max cricket, double wicket cricket, and single wicket cricket are all examples of cricket. Cricket is through an exciting moment of transition and development, which is forcing coaches to reconsider their teaching methods, approaches, and tactics. Sports performance is a complicated blend of genetic make-up and environmental factors such as training. Several elements influence cricket performance, including skill, technique, tactics, fitness, and training. Physical and mental fitness are both important factors in performance [1]. The game requires high level of physical fitness, stamina, strength, agility speed and cardiorespiratory endurance and self-control. Every sport requires a special set of workouts to grow cardiorespiratory endurance and ability of players. Sports training have been integral part of sports success, trends in the domain is continuously changing as per the demand of excellence in sports competition [2]. To improve agility, speed and cardiorespiratory endurance coaches often use the agility ladder drills and aerobic exercises in enhancing their performance [3].

2. Materials and Methods

For this study, out of sixty (60) male cricket players, forty-five (45) players were selected purposely form Govt. Higher Secondary School Bugam and Govt. Boys Higher Secondary School Yaripora. All the recruited participants were zone level players, who have to take part in the district level competition that will be organised by District Youth Service and Sports, Kulgam. During this recruitment, subjects signed participant information and consent form. All the details of the study such as purpose, testing procedure, period of involvement, risks, benefits and discomforts throughout the study and the freedom of participant to withdraw were include in the consent form. None of the subjects had lower-extremity injuries and surgery within 6 months prior to the pre-tests, any cardiovascular and metabolic disease. All the testes and training sessions were conducted in the school ground. The subjects had never involved such type of trainings and had normal dietary intake during the study. Participants were randomly divided into three groups of aerobic exercises group (AEG-I), ladder training group (LTG-II) and control group (CG). The descriptive characteristics of the subjects are in table 1.

Table 1: Descriptive Characteristics of the Groups

variables	AEG - I (*n* = 15)	LTG - II (*n* = 15)	CG (*n* = 15)
	Mean	Mean	Mean
Age (yrs.)	15.0	15.2	15.4
Height (cm)	167.4	168.8	169.1
Weight (kg)	57.2	58.8	59.5

2.1 Testing Procedure

The Illinois Agility Test was used to evaluate agility (15). On the basketball court, four cones were used to create a test area with a length of 10 metres and a width of 5 metres. Four more cones were set in the centre, spaced 3.3 metres apart. The photocells were placed at the beginning and end of the race. The individuals were told to run as fast as they could around the course. With a five-minute break between trials, the best result of the two trials was recorded.

2.2 Training Protocol

All workouts began with a general warm-up and ended with a 5-10 minute cool-down time (low-intensity cardio vascular exercise, stretching, etc.). All topics were monitored by a trainer to ensure that all programme requirements were followed to the letter. Trainers were specifically responsible for ensuring that exercise prescriptions were followed and attained during a training (e.g., appropriate spotting, appropriate safety considerations, prescribed rest periods, and proper hydration requirements). The aerobic exercise group AEG-I performed upper and lower-body exercises in two training sessions per week (Monday, Wednesday and Friday) for 8 weeks. Aerobic exercise programme included walking, cycling, running, jump rope, jump jack, burpee, dance, hiking, push-ups, squats, jogging, yoga, step aerobics, high knees and side to side ankle hoops, The Ladder training group LTG G-II performed lower-body exercises in three training sessions per week (Tuesday, Thursday, and Saturday) for 8 weeks. The training programme included; 6×6 hurdles, walk run, bunny hoops, fast foot ladder, step ups, break way belts, zig zags, single leg and lateral runs.

2.3 Statistical Analysis

All data are presented as mean ± SD. Paired *t*-tests were used to identify any significant differences between the groups at the pre and post tests for the dependent variables. Effect sizes were determined using the method and interpreted based on the recommendations of Rhea [14] who defines < 0.50, 0.50–1.25, 1.25–1.90, and > 2.0 as trivial, small, moderate, and large, respectively. A criterion α level of $p \leq 0.05$ was used to determine statistical significance. Statistics were analysed using SPSS ver. 25.

3. Results

3.1 Analysis of cardiorespiratory Endurance

The descriptive analysis showing mean pre, post, percentage and effect size of improvement and 't' ratio of the collected data on cardiorespiratory endurance among experimental and control group are presented in table 2.

Table 2: Paired T-test for the Pre-and Post-test of the Cardiorespiratory Endurance.

Variable Name	Groups	Pre-test SD	Post-test SD	M.D	% Change	ES	T. Ratio	Sig.
Cardiorespiratory Endurance	AEG-I	1970.00 109.87	2186.66 131.56	216.66	10	1.97	5.07*	0.00
	LTG-II	2013.33 135.57	2133.33 140.99	120.00	5.96	0.88	8.80*	0.00
	CG	2046.66 145.73	2076.00 137.83	29.33	0.20	0.20	1.56	0.14

*Significant at 0.05 level (Required Table value 2.14 with df 14) E.S = Effect Size

It is clear from the table II, that there were significant difference (p<0.05) in both experimental groups and significant changes between pre-test and post-test data on cardiorespiratory endurance, of aerobic exercises group (AEG-I) and ladder training group (LTG-II) because the obtained 't' ratio is 5.07 and 8.80 which is greater than the required table value of 2.14 at 0.05 level of significance for the df 14. The results of the study shows 10, 5.96 and 0.20% change from pre to post training with 1.97, 0.88 and 0.20 effect size within the group for cardiorespiratory endurance. The percentage of changes on cardiorespiratory endurance of aerobic exercises group (AEG-I), ladder training group (LTG-II) and control group are given in the figure 1.

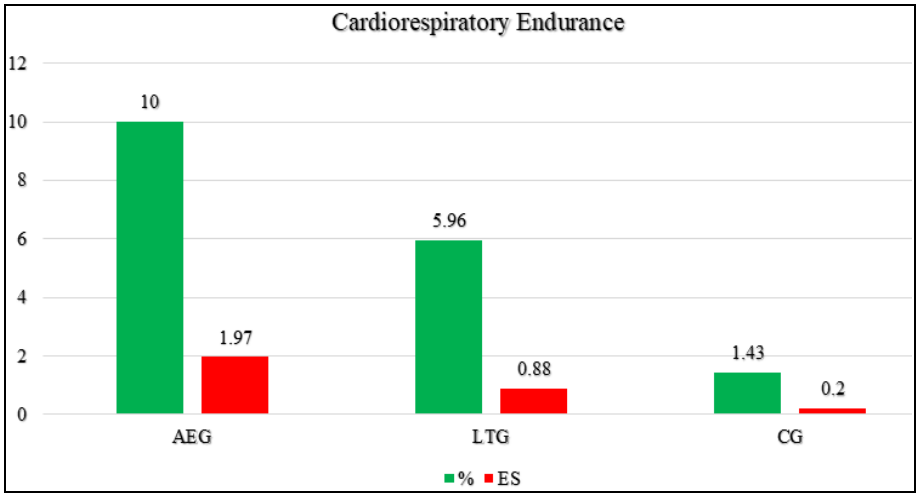

Fig 1: % change and effect size in three groups of Cardiorespiratory Endurance.

3.2 Analysis of Agility

Table 3: Paired T-test for the Pre-and Post-test of the Agility

Variable Name	Groups	Pre-test SD	Post-test SD	M.D	% Change	ES	T. Ratio	Sig.
Agility	AEG-I	20.00 1.46	18.00 2.42	2.00	10	1.36	5.12*	0.00
	LTG-II	20.33 1.54	16.20 1.37	4.33	20.31	2.68	12.29*	0.00
	CG	20.40 1.40	20.26 1.53	0.14	0.68	0.10	0.22	0.22

*Significant at 0.05 level (Required Table value 2.14 with df 14) E.S = Effect Size

It is clear from the table III, that there were significant difference (p<0.05) in both experimental groups and significant changes between pre-test and post-test data on agility, of aerobic exercises group (AEG-I) and ladder training group (LTG-II) because the obtained 't' ratio is 5.12 and 12.29 which is greater than the required table value of 2.14 at 0.05 level of significance for the df 14. The results of the study shows 10, 20.31 and 0.68% change from pre to post training with 5.12, 12.29 and 0.22 effect size within the group for agility. The percentage of changes on agility of aerobic exercises group (AEG-I), ladder training group (LTG-II) and control group are given in the figure 2.

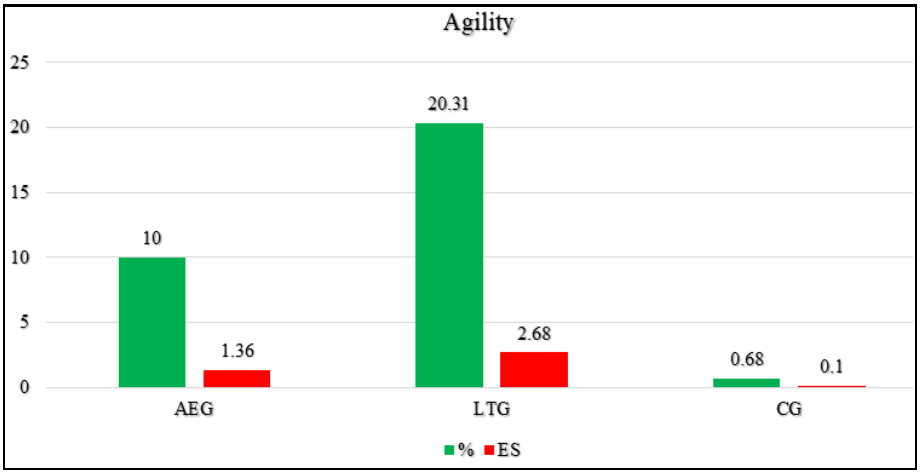

Fig 2: % change and effect size in three groups of Agility.

4. Discussion and Conclusion

The purpose of the present study was to compare the effects of aerobic exercises and ladder training on physical and physiological parameters among cricket players. The aerobic exercise group showed an improvement of 10% and 10% on cardiorespiratory endurance and agility during 8 weeks of training programme. Similarly ladder training group showed an improvement of 5.96% and 20.31% on cardiorespiratory and agility during the same training programme of 8 weeks. Control had not showed any improvement during the whole course of 8 weeks. The improvement of cardiorespiratory endurance was much better by aerobic exercise than ladder training and the improvement of agility was better by ladder training than aerobic exercises. The improvement may be due to the nature of the trainings and the type of exercises given in the training regime. The findings of the study are in conformity with the findings of Mustedanagic *et al*., (2016) [5] reported that the effect of aerobic exercise programme on cardiorespiratory endurance and body fitness on female students showed great improvement. Boileau *et al*., (1999) [6] showed that cardiorespiratory endurance increased by aerobic exercises in older adults. Sethu (2014) [8] conducted a study to find out the effects of eight weeks plyometric training and ladder training on speed, explosive power and agility of collegiate football players. Based on the result of their study it was revealed that plyometric training group was better in

improving sprinting, speed and vertical explosive power of football players, ladder training group was better in agility performance of football players. The increase of cardiorespiratory endurance and agility with aerobic exercises and ladder training is supposed to be due nature of the training and the exercises given in the training schedule. The results of this study demonstrated that eight-week aerobic exercises and ladder training increased adolescent cricket players' agility and cardiorespiratory endurance. In many nations, cricket is one of the most popular sports among children. A cricket match necessitates quick direction changes, hops, forward motion, lunges around the court. Consequently, the agility and vertical jump are important motor skills to win competition in cricket game. Coaches should incorporate in cricket training program with aerobic exercises and ladder training.

5. Acknowledgments

I am very much obliged to Annamalai University for allowing us to conduct this study, and I would like to express my gratitude especially to the subjects, college principal, and physical trainer who all participated and supported us in completing this study.

6. References

1. Dr. K. Gopinath, Dr. A.M.Moorthy, Dr. P.Ramasamy. Effects of Selected Yogic Practices on Cardio Vascular Endurance among State Level Cricket Players. International journal of recent research and applied studies; c2021, 2(1). ISSN: 2349 - 4891
2. Dr. kumaran. Wise blessed sing and kartikeyan. Effect of aerobic training on male football and cricket players. International journal of applied physiology. 2020;22(12):108-120.
3. Ashok Kumar, Satish, Rangna AP. Effect of ladder training and rope training on cricket players. Star journal of research. 2019;43(2):321-330.
4. Aksović N, Bjelica B, Joksimović M, Skrypchenko I, Filipović S, Milanović F, *et al*. Effects of aerobic physical activity to cardio-respiratory fitness of the elderly population: systematic overview. Pedagogy of physical culture and sports. 2020;24(5):208-218.
5. Mustedanagić J, Bratić M, Milanović Z, Pantelić SD. The effect of aerobic exercise program on the cardiorespiratory fitness and body composition of female college students. Facta Universitatis, Series: Physical Education and Sport; c2016. p. 145-158.
6. Boileau RA, McAuley E, Demetriou D, Devabhaktuni NK, Dykstra GL, Katula J, *et al*. Aerobic exercise training and cardiorespiratory fitness in older adults: A randomized control trial. Journal of aging and physical activity. 1999;7(4):374-383.
7. Chang YK, Chi L, Etnier JL, Wang CC, Chu CH, Zhou C. Effect of acute aerobic exercise on cognitive performance: Role of cardiovascular fitness. Psychology of Sport and Exercise. 2014;15(5):464-470.
8. Sethu SP, Gangadharan S, Chan SH, Stimming U. Development of a novel cost effective methanol electrolyzer stack with Pt-catalyzed membrane. Journal of Power Sources. 2014 May 15;254:161-7.