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IMPACT OF COMPLEX AND CONCURRENT TRAINING ON ANAEROBIC POWER AMONG KABADDI PLAYERS

[1.]Dr.Asha D., [2.] Pavan.H.R

[1.] Physical Education Director Janatha government first grade College, Basavapatana, Karnataka.

[2.] Physical Education Director R.L.Law College PJ Extension Akkamahadevi Road Davanagere Karnataka.

[1.] E-mail: ajmalahamad22@gmail.com

Abstract: *The purpose of the study is to assess the concurrent and complex training on anaerobic power kabaddi players. To achieve the purpose of the study, the investigator selected forty five rural area kabaddi players as participants in the age group of 15 to 18 years. Of the forty five kabaddi players, fifteen players performed concurrent training (group-I), another fifteen performed complex training and the remaining fifteen acted as control. The anaerobic power was selected as dependent variable. By conducting Running-based Anaerobic Sprint Test, the data were collected before as well as after training. Pre and post test random group design was adopted. The assessed data of the three group's through standardized tests was analyzed to discover the significant variation between two tests (pre & post) through paired 't' test. Additionally, magnitude (%) of changes was also calculated. To abolish the early mean disparity, the three group's data (pre&post) were calculated through ANCOVA statistics. When the 'F' (adjusted) score in ANCOVA was high, the post hoc (Scheffe's) test was followed. The confidence level 0.05 was set. After 12 weeks of treatment, Concurrent (3.61%) and Complex training (5.89%), group's anaerobic power performance enhanced considerably.*

Key Words: *Concurrent and complex training anaerobic power, Rural area kabaddi players.*

1. INTRODUCTION

In current competitive sports, sincerity towards work and exercises plays a significant part in gaining great performance in competition. Most of the team sports contains many complex human movement, where we can observed them at different levels during the movements. This is particularly true for a team sports kabaddi. Kabaddi is basically an outdoor team game, played in the tropical countries of Asia. In India kabaddi is major sports, which is played all over the India. In India kabaddi is major sports, which is played all over the India. This game is also getting a good status in Asian sports. Kabaddi is basically an Indian game, which requires both skill and power. Kabaddi combines the characteristics of wrestling and rugby. Kabaddi is aptly known as the "Game of the Masses" due to its popularity, simple, easy to comprehend rules, and public appeal. Kabaddi is played in more than sixty five countries especially Asian countries.

In the case of Kabaddi, the basic skills like holding, riding, blocking, and breath holding are highly needed. The coaches and trainees may not be able to determine them by their subjective observations of performances alone. A scientific analysis of the player's performance with respect to their skills might help in a much more positive way. This will enable not only the right type of selection based on scientific data but also help in maximizing the player's potentials by regrouping and synchronizing the team talents that are available. Kabaddi is a strength game. Without endurance the player cannot perform well, in the same time the player's need all the characteristics i.e. speed, agility, flexibility, endurance.

Concurrent training (CT) is defined as the combination of resistance and endurance training in a periodized program to maximize all aspects of physical performance. A combination of both power-related and endurance-related attributes are required to excel in mixed-type sports. Mixed type sports are sports that depend on several different energy systems and different strength and speed properties. Mixed type sport athletes can have vastly different demands depending on the sport itself and the position played. Through a needs-analysis, all sports can be plotted onto an

endurance and strength attribute spectrum. A number of studies have shown that performing these two types of training simultaneously can be detrimental to the gains that might be made in performing one type of training alone(2).

Complex training, also known as contrast training or post-activation potentiation training, involves the integration of strength training and plyometrics in a training system designed to improve explosive power. Complex training relies upon the performance of a strength exercise, often resistance based, followed by a plyometric exercise. The strength and the plyometric exercise are usually biomechanically similar i.e. they move through similar ranges of movement. As the muscles have been intensely activated by the strength exercise, this develops in the muscles a greater potential to apply force than they would have normally. Research suggests that complex training has an acute ergogenic effect on upper body power and the results of acute and chronic complex training include improved jumping performance. The combination of plyometric training and weight training are thought to be useful for developing athletic power. complex training is an effective training method for improving strength, power and speed, however whether it is superior method to conventional training methods remains uncertain and it is ultimately at the coach's discretion to select the training methods that are most applicable to their athletes and their environment. Hence, the purpose of the present study was to evaluate the impact of complex and concurrent training on anaerobic power among kabaddi players(4).

2. METHODOLOGY

Subject and Variable

To achieve the purpose of the study, the investigator selected forty five kabaddi players as participants in the age group of 15 to 18 years. Of the forty five kabaddi players, fifteen players performed concurrent training (group-I), another fifteen performed complex training and the remaining fifteen acted as control. The anaerobic power was selected as dependent variable. By conducting Running-based Anaerobic Sprint Test, the data was collected before as well as after training.

Training Programme

From forty five kabaddi players, fifteen players (group-I) performed concurrent training (Combination of Resistance & Aerobic Training), another fifteen performed complex training (Combination of Resistance & plyometric Training) and the remaining fifteen was act as control. Concurrent (resistance & aerobic) training groups performed resistance training during every odd numbered week and aerobic training during every even numbered week. The resistance training program was a total body workout consisting of 3 sets of 6-10 repetitions on 6 exercises that trained all the major muscle groups. A percentage of each subject's one-repetition maximum for each exercise was used to determine the intensity of each week. The intensity (60- 85% of 1RM) and number of repetitions performed for each exercise was progressively increased. The aerobic training group performing continuous running of two minutes duration for proposed repetitions and sets, alternating with active recovery based on work-rest ratio. The running intensity was determined by a percentage of maximum heart rate (HRmax). The intensity (60- 85% of HRmax) was amplified as training progressed. Complex (resistance & plyometric) training groups performed resistance training during every odd numbered week and plyometric training during every even numbered week as prescribed in the appendix-III. The resistance training program was a total body workout consisting of 3 sets of 6-10 repetitions on 6 exercises that trained all the major muscle groups. A percentage of each subject's one-repetition maximum for each exercise was used to determine the intensity of each week. The intensity (60- 85% of 1RM) and number of repetitions performed for each exercise was progressively increased. The plyometric training program consists of variety of exercises designed for the upper and lower extremity. Training volume ranged from 90 foot contacts to 140 foot contacts per session. Less intensive plyometric exercises was incorporated during the early stages of training to gradually condition the subjects and more demanding exercises was included when training progress.

Statistical Technique

To find out the pre and post test mean differences paired 't' test was applied. Percentage of improvement was also calculated. Further, the data collected from the three groups prior to and post experimentation on anaerobic power was statistically analyzed to find out the significant difference if any, by applying the analysis of covariance (ANCOVA). Since three groups were involved, whenever an obtained 'F' ratio value was found to be significant for adjusted post test means, the Scheffe's test was applied as post hoc test to determine the paired mean differences, if any. In all the cases the level of confidence was fixed at 0.05 level for significance.

3. RESULT :

The kabaddi player's anaerobic power was analyzed statistically and presented in table- 1-3.

Table – 1 Paired 't' Test Results and % of Changes on Anaerobic Power of Chosen Three Group's

Group	Test	N	Mean	SD	DM	't' - ratio	%
Concurrent Training	Pre	15	380.8667	72.86766	13.733	9.609*	3.61%
	Post	15	394.6000	72.97925			
Complex Training	Pre	15	389.6000	90.41792	22.933	7.257*	5.89%
	Post	15	412.5333	86.13517			
Control	Pre	15	391.2667	71.04170	8.400	6.788*	2.15%
	Post	15	382.8667	73.31231			

*Table value for df 14 is 2.15(*significant)*

The pre and post values of both training groups differ considerably since the 't' values of Concurrent (9.609) as well as Complex training (7.257) groups were greater than the table value (df14=2.15). After 12 weeks of treatment, Concurrent (3.61%) and Complex training (5.89%), group's anaerobic power performance enhanced considerably. By using ANCOVA statistics, the anaerobic power performance of all 3 groups were analyzed and exhibited in table - 2.

Table – 2ANCOVA Statistics Output on Anaerobic Power Performance of Chosen Three Group's

	Concurrent Training	Complex Training	Control	SoV	SS	df	MS	'F' ratio
Adjusted Mean	400.872	410.217	378.911	B	7744.415	2	3872.207	57.192*
				W	2775.924	41	67.705	

*(Table value for df 2 & 41 is 3.23)*Significant (.05 level)*

The ANCOVA result proved that the adjusted final means (CCT=400.872, CPT=410.217& CG=378.911) on anaerobic power performance of all 3 chosen groups significantly differs, as the derived 'F' value (57.192) is better than the required value (df 2 & 41 =3.23).
As the adjusted final means is significant, the follow up test was applied as put on view in table-3.

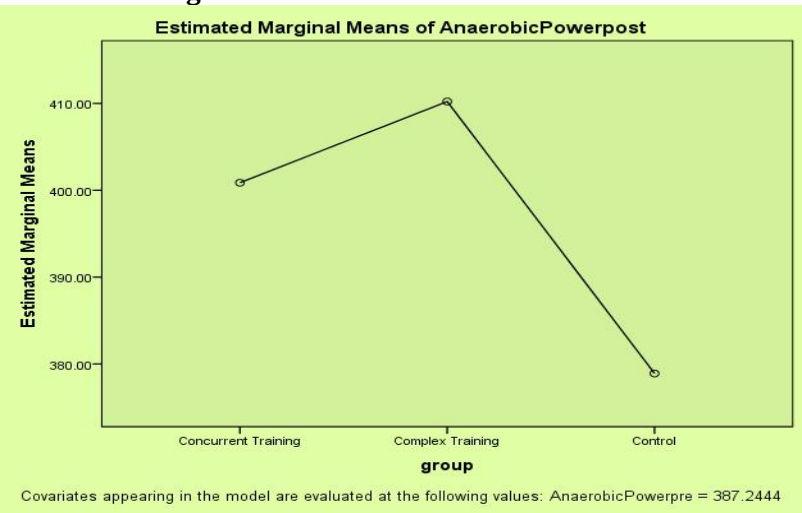
Table – 3 Scheffe's Test Outcome on Anaerobic Power Performance of Three Groups

Variable	Concurrent Training	Complex Training	Control	MD	CI
Aerobic Power	400.872	410.217		9.345*	5.05
	400.872		378.911	21.961*	5.05
		410.217	378.911	31.306*	5.05

**Significant (0.05)*

It proved that due to Concurrent (21.961) and Complex training (31.306) the anaerobic power performance was greatly enhanced. Though, Complex training was much better than Concurrent training (9.345) since the mean differences (21.961, 31.306 & 9.345) are higher than CI value (5.05). Chosen three group's anaerobic power performance scores are illustrated in figure-1.

Figure – 1 Chart Showing Anaerobic Power Performance of Chosen Groups



4. DISCUSSION:

The examination's results indicate that the kabaddi players from rural areas increased their overall fitness as a result of participating in a concurrent 12-week resistance and aerobic training program. Increases in aerobic capacity may be attributed to both the growth in fat-free mass and the hypertrophy of the muscles induced by strength training, as well as possibly to the high force and short rest periods of the strength program. The suggested increases in muscular power and running economy were made without affecting VO2max. Strength training has the potential to improve running economy by reducing the amount of time spent on the ground by enhancing the stretch-shortening cycle(6). With some type of solidarity training, improvements in high-intensity exercise can be achieved by advantages gained from neuromuscular characteristics, running economy, or anaerobic limit. Improved endurance execution and aerobic limit were the results of combined training, especially when strength training was performed in a similar session after hard exercise

Plyometric training has been shown in numerous training studies to enhance performance in sprinting, sprint cycling, long jumping, and vertical leaping. Furthermore, it seems that only a small amount of plyometric training is needed to enhance performance on these assignments(7). Motor performance can be markedly enhanced by performing just one or two plyometric exercise types three times a week for six to twelve weeks. Furthermore, a number of research studies on plyometric training have shown that a noteworthy rise in vertical jump height of approximately 10% was correlated with a commensurate improvement in sport-specific jumping, sprinting and distance-running performance.

5. CONCLUSION :

After 12 weeks of treatment, concurrent (3.61%) and complex training (5.89%), group's Anaerobic Power enhanced considerably. Although, complex training is much superior to concurrent training in developing Anaerobic Power of male kabaddi players. The majority of evidence has demonstrated that concurrent and complex training can be used to simulate the overall demands of competition(8). From a practical perspective, concurrent and complex training should be supplemented with more traditional conditioning to simulate the high-intensity demands of competition.

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