EFFECT OF CONDITIONING WITH AND WITHOUT BALL ON CARDIO-RESPIRATORY ENDURANCE AND AGILITY OF SOCCER PLAYERS

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Abstract

The study's main purpose was to determine the significant effect on cardiorespiratory endurance and agility of soccer players due to conditioning with and without ball. Sixty (N=60) men soccer players were selected from the super division level of Imphal East and Imphal West districts, Manipur by adopting a simple random sampling method. The age of the subjects ranged from 18 to 25 years and they were randomly assigned into two equal groups of thirty each (n=30), namely the Experimental Group (EG) and Control Group (CG). Copper 12 minutes run/walk test and Semo agility test were applied for the collection of data on Cardiorespiratory Endurance and Agility respectively. The EG underwent conditioning with and without ball for 12 weeks where the number of sessions per week was delimited to five (5) days. The training program was one hour for the first two weeks and an increase of five (5) minutes duration was followed every after two weeks. CG was not given any conditioning program. Pre-test data were collected before the administration of experimental treatment of conditioning with and without ball and post-data were collected immediately after the completion of 12 weeks of training program.

Dependent t-test was employed to find out the significant improvement of Cardiorespiratory Endurance and Agility of Experimental and Control Groups. Further ANCOVA was computed to determine the significant difference between the means of adjusted post-test of EG and CG. The level of significance was set at 0.05. Statistical analysis revealed significant improvement in Cardiorespiratory Endurance and Agility among the subjects of EG while compared with the CG. The Experimental Group with 12 weeks of conditioning with and without ball significantly improved Cardiorespiratory Endurance and Agility of soccer players compared to the Control Group.

Index Terms: **Soccer, Cardiorespiratory Endurance, Agility, and With & Without Ball Conditioning.**

I. INTRODUCTION

Though soccer or modern football played for a long time of 90 minutes or more; required sufficient strength and endurance as well as proper playfield in the players concerned. Whatever may be the standard of competitions, the shooting or kicking of football is one of the unavoidable skills in the same situation. If a team mate is standing for away from the player and the player wants to pass the ball to that particular player, or sometimes player wants to shoot the ball with force accuracy in the goal-posts, the kicking as well as playing ability is essential for the score.

Endurance training can be carried out in the form of forest or cross-country running, or in the form of appropriate exercises with the ball. It is an accepted fact that endurance training with the ball is easier to bear and is more fun for the participants. Players who are better trained endurance-wise are less prone to injuries and thus again and again more quickly re-achieve full capacity. The endurance-trained player is thus more stress-resistant and has a higher degree of psychological stability which makes him more able to deal with frustration, defeats and motivation problems. Endurance training should nevertheless not be carried out for its own sake but should always be seen in regard to soccer. For the soccer player, this means he does not have to improve his endurance ability to maximum levels of excess but rather to better integrate it into the technical and tactical total plan. Not only general aerobic endurance is required of the player. Special anaerobic endurance increases physical capacity too. The ability to repeat speed and direction changes, accelerations, headers, goal shots etc. as often as possible during the whole game are characteristics of this special kind of endurance.

Agility may be combined with fast-feet drills in movements specific to soccer. A series of cones may be placed over 10–12 m with players first maneuvering their way through with strides shorter but faster than normal. The movements are then performed backwards, sideways to the right and sideways to the left. Players can do the sequences in pairs to provide an element of competition between them. A whole variety of such drills can be designed by the trainer.

The frequency of training refers to how many separate training sessions are undertaken each week. These may include sessions twice-a-day at certain parts of the competitive season, especially during the pre-season period. Fewer sessions would be expected at times when the competitive calendar is congested with fixtures.

It is well-known fact that every sport demands motor fitness in order to compete in high-level competition and even higher according to the nature of the game. Similarly, soccer games demand great motor fitness where the intensity and duration are very high. It is often seen in a team that even though they have high-skill players, they could not make much difference in scoring or creating a chance to score. It may be due to the lack of motor fitness of the team players and the greater motor fitness of opponents must have affected scoring and creating chance due to high press from the opponent team. So, taking note of the importance of motor fitness, the scholar wanted to find out that conditioning with and without ball may improve cardiorespiratory endurance and agility of soccer players and therefore the scholar had taken up the study stated as "Effect of Conditioning With and Without Ball on Cardiorespiratory Endurance and Agility of Soccer Players."

On the basis of literature, discussion with the experts, and personal experience of the scholar, it was hypothesized that -

H_1: There might be significant improvement in cardiorespiratory endurance due to conditioning with and without ball.

H_2: There might be significant improvement in agility due to conditioning with and without ball.

III. RESEARCH METHODOLOGY

To achieve the purpose of the study, sixty (N=60) men soccer players were selected from the super division level of Imphal East and Imphal West districts, Manipur by adopting a simple random sampling method. The age of the subjects ranged from 18 to 25 years and they were randomly assigned into two equal groups of thirty each (n=30), namely Experimental Group (EG) and Control Group (CG).

Pre-test data were collected before the administration of experimental treatment of conditioning with and without ball. Copper 12 minutes run/walk test was applied for the collection of data on cardiorespiratory endurance where the subjects ran for 12 minutes and the total distance covered in meters was recorded as the final score. Semo agility test was applied for the collection of data on agility where the subjects performed side-stepping, back-pedalling and forward running in an area of 3.6 m x 5.7 m size marked with cones. The lesser value of the time out of the two trials was recorded as the final score of the subject.

The Experimental Group underwent conditioning with and without ball for 12 weeks where the number of sessions per week was delimited to 5 days. The training program was of 1 hour for the first two weeks and kept on an increase of 5 minutes duration was followed every after two weeks. Control Group was not given any conditioning program. Post data were collected immediately after the completion of 12 weeks of a training program.

IV. RESULTS AND DISCUSSION

The data pertaining to each of the selected variables namely Cardiorespiratory Endurance and Agility were examined statistically by applying dependent 't'-test in order to determine the significance of difference between the pre and post-test of Experimental and Control Group. The level of significance to test the hypothesis was set at .05.

Table - 1

Description of Means, Standard Deviations and t-ratios for the Data on Selected Variables of Experimental Group

Variables	Pre-Test Mean	Post-Test Mean	MD	SD Pre	SD Post	SE DM	t-ratio
Cardio respiratory Endurance	2134	2188	53.8	114.70	112.53	3.684	14.62*
Agility	11.8	11.4	0.36	0.35	0.0647	0.05018	7.12*

* Significant at .05 level   Tabulated $t_{0.05(29)} = 2.045$

It is evident from the findings above in Table-1 that significance of difference is observed in the variable of Cardiorespiratory Endurance and Agility as the obtained t-value 14.62 and 7.12 respectively are higher than the tabulated value of 2.045 at .05 level for the 29 degrees of freedom. On the basis of the above findings, it may be inferred that significant improvement occurs in the selected variables due to 12 weeks of conditioning with and without ball training program.

Table - 2

Description of Means, Standard Deviations and t-ratios for the Data on Selected Variables of Control Group

Variables	Pre-Test Mean	Post-Test Mean	MD	SD Pre	SD Post	SE DM	t-ratio
Cardio respiratory Endurance	2218	2222	4.6	135.06	136.19	4.922	0.941@
Agility	11.9	11.8	0.082	0.4803	0.479	0.02975	2.745*

* Significant at .05 level   Tabulated $t_{0.05(29)} = 2.045$

@ Insignificant at .05 level

The findings of Table-2 shows that no significant difference was observed in the variable of Cardiorespiratory Endurance as the obtained t-value of 0.941 is smaller than the tabulated value of 2.045 at .05 level for the 29 degrees of freedom. It is also evident that significant difference was observed in the variable of Cardiorespiratory Endurance as the obtained t-value 2.745 is greater than the tabulated value of 2.045 at .05 level for the 29 degrees of freedom. On the basis of the above findings, it is clearly understood that significant improvement occurs in Agility even though no training was given whereas Cardiorespiratory Endurance did not show any significant improvements.

Since both the groups indicate significant differences in the variables of Agility between pre and post-tests therefore to determine which group shows greater improvement in their post-test performance ANCOVA is applied and it has been presented in Table-3.

Table - 3

Analysis Of Covariance for the Data on Agility Between Experimental Groups and Control Group

Adjusted Means		Source of Variance	Sum of Squares	df	Means Squares	F-ratio	P Value
EG	CG						
11.5	11.7	TG	10.62	1	10.6247	211.9	<0.001*
		EG	2.81	57	0.0501		

It is evident from the findings of above Table - 3 that significant difference is observed among the adjusted means as the resultant F-ratio 211.9 is much greater than the required tabulated F-value of 4.01 at .05 level for the 1, 57 degrees of freedom (p<0.001).

Since the obtained F-ratio is found significant therefore LSD post hoc test is applied to determine the paired mean difference of Experimental and Control Groups.

Table – 4

Paired Mean Difference for the Adjusted Means of Agility Between Experimental Group and Control Group

EG	CG	Mean Difference	Critical Difference	P- Value
11.5	11.7	0.3*	0.115	<0.001

Findings of Table – 4 show that there is significant difference in the adjusted means between Experimental Group (Conditioning with and without ball) and Control Group as the mean difference value of 0.3 is greater than the critical difference value of 0.115 (MD=0.3>CD=0.115). On the basis of above findings, it is understood that Experimental Group has shown significant improvement in Agility while compared with the Control Group.

Table – 5

Description of Pre, Post and Adjusted Mean of Cardiorespiratory Endurance of Experimental Group and Control Group

Groups	Pre-Test Mean	Post-Test Mean	Adjusted Mean
Experimental	2134	2188	2225
Control	2218	2223	2220

Table - 5 shows that the pre-test, post-test and adjusted means of Experimental Group and Control Group on Cardiorespiratory Endurance are 2134,2188 & 2225, 2218, 2223 & 2220 respectively.

The pre-test, post-test and adjusted post-test mean values of Experimental Group and Control Group on Cardiorespiratory Endurance are graphically represented in figure – 1.
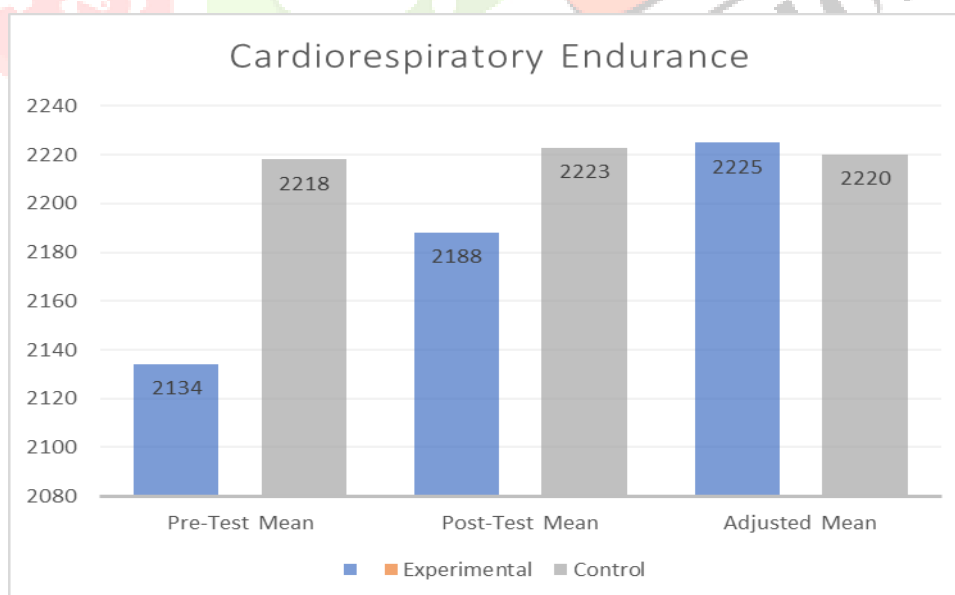

Figure - 1

Pre-Test, Post-Test and Adjusted Post-Test Mean Difference between the Experimental Group and Control Group in Cardiorespiratory Endurance of Soccer Player.

Table - 6

Description Of Pre, Post and Adjusted Mean of Agility of Experimental Group and Control Group

Groups	Pre-Test Mean	Post-Test Mean	Adjusted Mean
Experimental	11.8	11.4	11.5
Control	11.9	11.8	11.7

Table - 6 shows that the pre-test, post-test and adjusted means of Experimental Group and Control Group on Agility are 11.8,11.4 & 11.5 and 11.9,11.8 & 11.7 respectively.

The pre-test, post-test and adjusted post-test mean values of Experimental Group and Control Group on Agility are graphically represented in figure – 2.
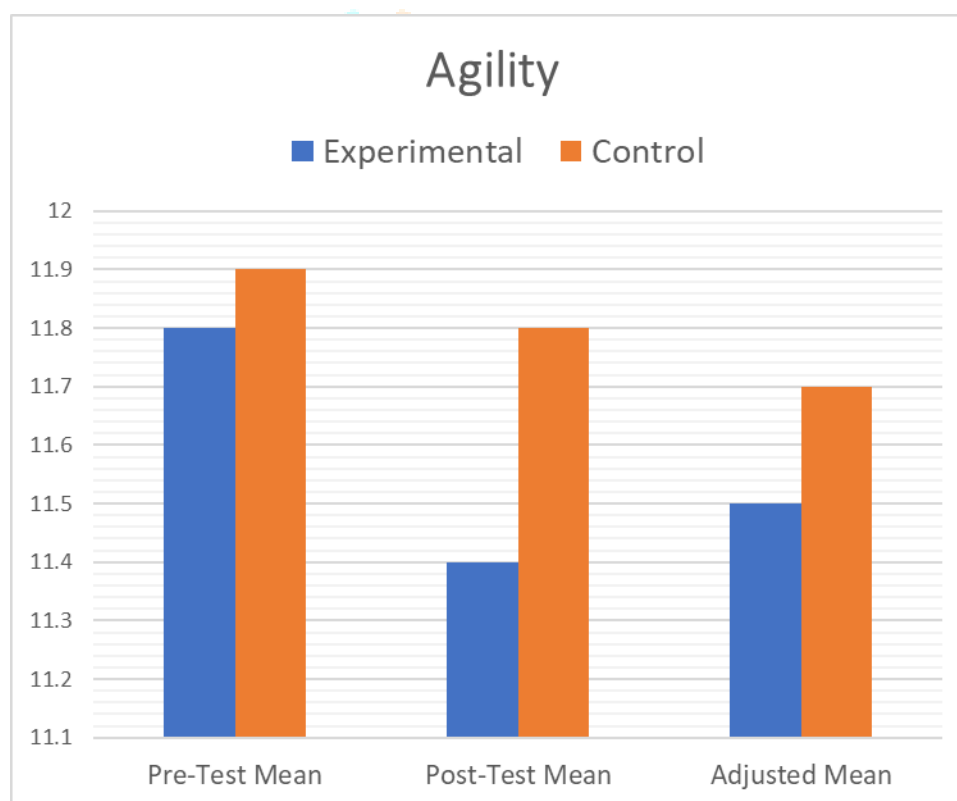

Figure - 2

Pre-Test, Post-Test and Adjusted Post-Test Mean Difference between the Experimental Group and Control Group in Agility of Soccer Player.

Interpretation of Results

The findings of statistical analysis revealed that both the selected dependent variables improved significantly after the 12 weeks of a training program of conditioning with and without ball. It may be attributed to the fact that the nature of training consisted of conditioning exercises with and without ball for 12 weeks duration, all those exercises and drills selected were directly related to improve endurance and quick movement in all direction which led to enhance the cardiorespiratory endurance and agility of soccer players. Hence such results might have occurred in the study.

Findings also showed significant improvement of the Control Group on the variable of Agility. It may be because the control group with no specific training was allowed for the regular game practices as well as to take part in the competitions and tournaments. Therefore, they might have improved the agility performance.

Testing of Hypotheses

In the beginning of the study, hypotheses were formulated and on the basis of statistical findings they were accepted or rejected.

H₁: There might be significant improvement in cardiorespiratory endurance due to conditioning with and without ball.

Significantly better improvement ($t=14.62$) was found in dribbling of soccer players due to conditioning with and without ball training program for 12 weeks while compared to control group ($t=0.941$). Hence Hypothesis is accepted.

H₂: There might be significant improvement in agility due to conditioning with and without ball.

Significantly better improvement ($F=2119$) was found in agility of soccer players due to of conditioning with and without ball training program for 12 weeks while compared to control group. ($MD=0.3 > CD=0.115$). Hence Hypothesis is accepted.

Conclusion

1.   Conditioning with and without ball training program for 12 weeks improved the Cardiorespiratory Endurance of soccer players.
2.   Agility of the soccer players also improved due to 12 weeks of conditioning with and without ball.
3.   Therefore, it may be fairly recommended that to develop the optimum motor fitness level of the soccer players conditioning with and without ball (most suitable drills and exercises) should be included in the training program.

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