EFFECTS OF COMPLEX TRAINING ON ENDURANCE AND DRIBBLING ABILITY OF INTER-COLLEGIATE FOOTBALL PLAYERS

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ABSTRACT

Forty five intercollegiate level male Football players were selected from different affiliated colleges of Bharathiar University. The selected subjects were randomly divided into three groups (15 in each group). Group I was considered as High Load Complex Training Group. Group II was considered as Contrast Load Complex Training Group. Group III was considered as Control Group which was not given any training. The variables are Endurance and Dribbling ability. The intensity for the high load complex training group was increased consistently. The intensity for the contrast load training group was increased and decreased alternatively. The training was given 5 days a week for 6 weeks. Pre-test was conducted for all the three groups before giving the training and post-test was conducted after 6 weeks of training. The statistical technique used was ANCOVA. The result of the study showed that high load complex training improved endurance and dribbling ability better than contrast load complex training after 6 weeks of training program among the male inter-collegiate foot ball players.

Keywords: High Load Complex Training, Contrast Load Complex Training, ANCOVA and Football.

INTRODUCTION:

Football is quite simply, the most popular sport in the world, a game where humanity comes alive with one goal .It inspires and enthuses millions of people all over the world. The Federation of International de Football Association (FIFA) is probably the single largest organization in the world. With the establishment of the Football Association in England in 1863, Football has evolved into fiercely competitive sport, requiring the highest levels of physical fitness, technical skill, courage and endurance. According to Baechle and Earle, "complex training is a combination of high intensity resistance training followed by plyometrics". However, a somewhat more detailed definition is provided by Ebben who states: "Complex training alternates biomechanically similar high load weight training exercises with plyometric exercises, set for set in the same workout. An example of complex training would include performing a set of squats followed by a set of jump squats." As in the case of plyometric training, complex training appears to have its origins in Eastern Europe. Certainly this is the argument put forward by Chu: "Complex training was

developed by the Europeans to blend the results of heavy weight training with what they call shock training and what we call plyometrics." Note that in some programmes, the plyometric or explosive drill precedes the strength exercise. Complex training activates and works the nervous system and fast twitch muscle fibers simultaneously. The strength exercise activates the fast twitch muscle fibers (responsible for explosive power). The plyometric movement stresses those muscle fibers that have been activated by the strength training movement. During this activated state, the muscles have a tremendous ability to adapt. This form of intense training can teach slow twitch muscle fibers to perform like fast twitch fibers.

METHODOLOGY

Forty five intercollegiate level male Football players were selected from different affiliated colleges of Bharathiar University during the academic year 2007-08. The selected subjects were randomly divided into three groups (15 in each group). Group I was considered as High Load Complex Training Group. Group II was considered as Contrast Load Complex Training Group. Group III was considered as Control Group which was not given any training. The dependant variables are Endurance and Dribbling ability. Endurance was measured by 12 minutes run/walk test, dribbling ability was measured by monitoring total time of dribbling. Each training session started with light warm-up and ended with cool-down exercises. The intensity for the high load complex training group was increased consistently. The intensity for the contrast load training group was increased and decreased alternatively. The training was given 5 days a week for 6 weeks. The training schedule for group I and group II are:

Table 1

Group I - High load complex training group– Training schedule

Week	Weight training	Plyometric exercises	Set	Repetition	Intensity
1.	Leg press, half squat, knee extension, leg curl, abdominal curl, heal raise	Bounds, box jump, Hurdle hopping, Single leg hop, depth jump, two leg hopping	3	6-8	70%
2.	Leg press, half squat, knee extension, leg curl, abdominal curl, heal raise	Bounds, box jump, Hurdle hopping, Single leg hop, depth jump, two leg hopping	3	6-8	75%
3.	Leg press, half squat, knee extension, leg curl, abdominal curl, heal raise	Bounds, box jump, Hurdle hopping, Single leg hop, depth jump, two leg hopping	3	6-8	80%
4.	Leg press, half squat, knee extension, leg curl, abdominal curl, heal raise	Bounds, box jump, Hurdle hopping, Single leg hop, depth jump, two leg hopping	3	6-8	85%
5.	Leg press, half squat, knee extension, leg curl, abdominal curl, heal raise	Bounds, box jump, Hurdle hopping, Single leg hop, depth jump, two leg hopping	3	6-8	90%

6.	Leg press, half squat, knee extension, leg curl, abdominal curl, heal raise	Bounds, box jump, Hurdle hopping, Single leg hop, depth jump, two leg hopping	3	6-8	95%

*Rest was for 2 minutes in between sets and duration was for 45 minutes for each session.

Table 2

Group II - Contrast load complex training group – Training schedule

Week	Weight training	Plyometric exercises	Set	Repetition	Intensity
1.	Leg press, half squat, knee extension, leg curl, abdominal curl, heal raise	Bounds, box jump, Hurdle hopping, Single leg hop, depth jump, two leg hopping	3	6-8	75%
2.	Leg press, half squat, knee extension, leg curl, abdominal curl, heal raise	Bounds, box jump, Hurdle hopping, Single leg hop, depth jump, two leg hopping	3	6-8	65%
3.	Leg press, half squat, knee extension, leg curl, abdominal curl, heal raise	Bounds, box jump, Hurdle hopping, Single leg hop, depth jump, two leg hopping	3	6-8	80%
4.	Leg press, half squat, knee extension, leg curl,	Bounds, box jump, Hurdle hopping, Single leg hop, depth jump, two leg	3	6-8	70%

	abdominal curl, heal raise	hopping			
5.	Leg press, half squat, knee extension, leg curl, abdominal curl, heal raise	Bounds, box jump, Hurdle hopping, Single leg hop, depth jump, two leg hopping	3	6-8	85%
6.	Leg press, half squat, knee extension, leg curl, abdominal curl, heal raise	Bounds, box jump, Hurdle hopping, Single leg hop, depth jump, two leg hopping	3	6-8	75%

*Rest was for 2 minutes in between sets and duration was for 45 minutes for each session.

Pre-test was conducted for all the three groups before giving the training and post-test was conducted after 6 weeks of training. The statistical technique used was ANCOVA. When the study was significant, the scheffe's post hoc test was used to find out the paired mean difference.

ANALYSIS OF DATA AND RESULTS OF THE STUDY

The level of significance to test-F-ratio obtained by the analysis of covariance was fixed at 0.05 level of confidence.

Table 3 : Analysis of co-variance on pre, post and adjusted means on endurance

Test	High load complex training	Contrast load complex training	Control group	Source of variance	Sum of square	df	Mean square	F ratio
Pre- test	2261.33	2195.33	2061.3	B/G	311560	2	155780	1.44

			3	W/G	4547720	42	108279.05	
Post-test	2654.66	2397.33	2103.33	B/G	2283124	2	1141562.22	11.31*
				W/G	4240600	42	100966.67	
Adjusted mean	2574.51	2376.84	2203.98	B/G	968590.81	2	484295.40	37.91*
				W/G	523742.71	41	12774.21	

* Significant level at 0.05 level

The adjusted post test means on High load complex training, Contrast load complex training and control group were 2574.51, 2376.84 and 2203.98 respectively and the obtained F ratio of 37.91 was greater than the required table value of 3.21, which indicates that test was significant at 0.05 level of confidence for the degrees of freedom 2 and 42. The results of the study indicate that there was statistically significant difference in endurance. Further, to determine which of the paired means had significant difference Scheffe's post hoc test was applied.

Table 3.1: Scheffe's post hoc test for the difference between the adjusted post-test paired means of endurance

High load complex training	Contrast load complex training	Control group	Mean difference	Confidence interval
2574.21	2376.84	------	197.37	103.89
2574.21	-----	2203.98	370.23	103.89
------	2376.84	2203.98	172.86	103.89

* Significant level at 0.05 level

Table 3.1 indicates that the mean difference in endurance between High load complex training group and Contrast load complex training group is 197.37, it is higher than the confidence interval of 103.89.11 required for significance at 0.05 level . The mean difference in endurance between High load complex training and control group is 370.23, it is higher than the confidence interval of 103.89 required for significance at 0.05 level. The mean difference in endurance between contrast complex load training and control group is 172.86, it is higher than the confidence interval of 103.89 required for significance at 0.05 level.

This clearly indicates that there is better improvement in the High load complex training group than the contrast load complex training group and control group. It may be concluded from the results of the study that 6 weeks of training increased endurance significantly for High load complex training group than the contrast load complex training group.

Table 4 : Analysis of co-variance on pre, post and adjusted means on dribbling

Test	High load complex training	Contrast load complex training	Control group	Source of variance	Sum of square	df	Mean square	F ratio
Pre- test	16.02	15.84	18.43	B/G	62.88	2	31.44	3.60*
				W/G	366.80	42	8.73	
Post-test	15.06	15.03	18.33	B/G	107.85	2	53.93	6.56*
				W/G	345.21	42	8.22	
Adjusted mean	15.78	15.92	16.72	B/G	6.69	2	3.34	28.99*
				W/G	4.43	41	0.12	

* Significant level at 0.05 level

The adjusted post test means on High load training, Contrast load complex training and control group were 15.72,15.92 and 16.72 respectively and the obtained F ratio of 28.99 was greater than the required F ratio of 3.21, which indicates that test was significant at 0.05 level of confidence for the degrees of freedom 2 and 42. The results of the study indicate that there was statistically significant difference in dribbling. Further, to determine which of the paired means had significant difference Scheffe's post hoc test was applied.

Table 4.1 : Scheffe's post hoc test for the difference between the adjusted post-test paired means of dribbling

High load complex training	Contrast load complex training	Control group	Mean difference	Confidence interval
15.78	15.92	------	0.14	0.30
15.78	-----	16.72	0.94	0.30
------	15.92	16.72	0.80	0.30

* Significant level at 0.05 level

Table 4.1 indicates that the mean difference in dribbling between High load complex training group and Contrast load complex training group is 0.14, it is lesser than the confidence interval of 0.30 required for significance at 0.05 level. The mean difference in dribbling between High load complex training and control group is 0.94, it is higher than the confidence interval of 0.30 required for significance at 0.05 level. The mean difference dribbling between contrast load complex training and control group is 0.80, it is higher than the confidence interval of 0.30 required for significance at 0.05 level.

This clearly indicates that there is better improvement in the High load complex training group than the contrast load complex training group and control group. It may be concluded from the

results of the study that 6 weeks of training increased dribbling significantly for High load complex training group than the contrast load complex training group.

DISCUSSION

Football is the most popular sport in the world. Scientific methods of sports training are required to attain greater heights in the game of Football. Training is usually defined as a systematic process of repetitive progressive exercise or work, involving the learning process and acclimatization (David, D. 1987). The performance of a footballer is largely depended upon his or her football specific physical fitness and improvement in football specific physical fitness happens only when the general physical fitness is improved. The contribution of physical fitness towards sports performance is indirect. But it should never be overlooked that specific physical fitness depends largely on the general physical fitness (Hardayal Singh 1983). Complex training, one of the most advanced forms of sports training, integrates strength training, plyometrics, and sport-specific movement. It consists of an intense strength exercise followed by a plyometric exercise. According to Ebben and Watts: "High load weight training increases motor neuron excitability and reflex potentiation which may create optimum training conditions for subsequent plyometric exercise. Also, the fatigue associated with high load weight training may force more motor units to be recruited during the plyometric phase, possibly enhancing the training state." The results of the study reveals that there was a significant improvement in endurance and dribbling ability after the completion of 6 weeks of complex training program among the male inter-collegiate foot ball players as compared to the control group. Further the study revealed that there was better improvement due to high load complex training programme on endurance and dribbling ability than contrast load complex training programme.

CONCLUSIONS

Based on the analysis and results of the study the following conclusions were drawn.

1. High load complex training and contrast load complex training improved endurance and dribbling ability after the six weeks of training programme among the male inter-collegiate foot ball players.

2. Six weeks of high load complex training improved endurance and dribbling ability better than contrast load complex training among the male inter-collegiate foot ball players.

3. Six weeks of contrast load complex training improved endurance and dribbling ability better than control group among the male inter-collegiate foot ball players.

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