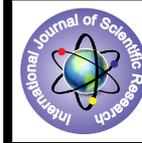


Effect of Large and Progressed Toward Small Muscle Group Exercises and Small and Advanced to Large Muscle Group Exercises on Explosive Power Parameters of Men Soccer Players



Physical Education

KEYWORDS : Explosive power in vertical direction (EPVD), Explosive power in horizontal direction (EPHD)

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ABSTRACT

Aim of the study was to find out an influence of exercise order on Explosive power parameters of men Soccer. The study was conducted on forty five (N=45) under graduate Soccer players, studying various affiliated Engineering Colleges in Anna University, Chennai, Tamilnadu, India during the year 2012-2013 were selected as subjects. The age of the subjects were ranged from 18 to 22 years. The subjects were assigned at random into three groups of fifteen each (n=15). Group-I underwent large and progressed toward small muscle group exercises (LG-SM), Group-II underwent small and advanced to large muscle group exercises (SM-LG), Group-III acted as control group (CG). The experimental groups underwent their respective training for 10 weeks. One repetition maximum (1RM) was given for all exercises. Among the Explosive power parameters explosive power in vertical direction (EPVD) and explosive power in horizontal direction (EPHD) were selected as dependent variables. Explosive power in vertical direction (EPVD) was assessed by Sargent Jump test and Explosive power in horizontal direction (EPHD) was assessed by standing long jump test. All the subjects were tested prior to and after the training for all the selected variables. The data collected from the three groups prior to and post experimentation was statistically analyzed by using Analysis of Covariance (ANCOVA). Scheffe's post hoc test was applied to determine the significant difference between the paired means. In all the cases .05 level of significance was fixed. The results of the study showed that there was a significant difference was found among the experimental groups. Small and advanced to large muscle group exercises (SM-LG) group is found to be better than other groups.

INTRODUCTION

Resistance training is a form of strength training in which each effort is performed against a specific opposing force generated by resistance (i.e. resistance to being pushed, squeezed, stretched or bent). Exercises are isotonic if a body part is moving against the force. Exercises are isometric if a body part is holding still against the force. Resistance exercise is used to develop the strength and size of skeletal muscles. Properly performed, resistance training can provide significant functional benefits and improvement in overall health and well-being.

Muscular strength is defined as the amount of force one is able to exert from one muscular contraction. In our case, it's more important to examine the combination of strength and endurance. They are important to allow people to enjoy a healthy an active lifestyle as they age. Lifting things at home and the office become much easier with muscular strength and endurance.

Exercise order refers to the sequence of resistance exercises in a training session. It has been recommended that exercises involving large-muscle groups be placed at the beginning of training sessions because this exercise sequence results in the ability to utilize the heaviest resistances possible when performing the large-muscle group exercises and may result in the greatest long-term strength gains in these exercises. Exercise sequence has also been recommended to be such to allow the use of training resistances and volumes that optimize training adaptations (Fleck, and Kraemer, 2004).

METHODOLOGY

Samples: Forty five (N=45) under graduate Soccer players studying various Engineering colleges affiliated to Anna University Chennai, Tamilnadu, India were consider as sample for the study. Thirty subjects were assigned randomly to experimental group and fifteen were assigned into control group.

Tools: The following tools were used to assess the Explosive powers.

Sl No	Variables	Test Items	Unit of Measurement
1	Explosive power in vertical direction (EPVD)	Sargent Jump test (Sargent, 1921)	In Centimeters
2	Explosive power in horizontal direction (EPHD)	Standing long jump test	In Meters

Procedure: This study was to design to determine the influence of exercise order on Explosive power parameters of men Soccer. The total sample consisted of forty five students ranged

between 18-22 years old. The subjects were assigned at random into three groups of fifteen each (n=15). Group-I underwent large and progressed toward small muscle group exercises (LG-SM), Group-II underwent small and advanced to large muscle group exercises (SM-LG) and Group-III acted as a control group (CG). All the two experimental groups undergo their respective training for 12 weeks. One repetition maximum (1RM) was given for all exercises.

TRAINING PROTOCOLS

As per the direction prescribed by Simao et al(2010)the following exercise order was given.

For LG-SM group:

- Barbell bench press (BP),
- Machine lat-pull down (LPD),
- Machine triceps extension (TE), and
- Free weight standing biceps curl with a straight bar (BC).

For SM-LG group:

- Free weight standing biceps curl with a straight bar (BC)
- Machine triceps extension (TE)
- Machine lat-pull down (LPD), and
- Barbell bench press (BP)

The control group did not take part in the resistance training program. A linear periodized resistance training program was used. From the first to the fourth week, four sets of each exercise were performed with light intensity (12 to 15 repetitions) with one minute of rest between the sets. From the fifth to the eighth week, three sets of each exercise were performed with moderate intensity (eight to 10 repetitions) with two minutes of rest between the sets. From the ninth to the twelfth week two sets of each exercise were performed with high intensity (three to five repetitions) with three minutes of rest between the sets. During the exercise sessions, participants were verbally encouraged to perform all sets to concentric failure and the same definitions of a complete range of motion used during the 1RM testing were used to define completion of a successful repetition. There was no attempt to control the velocity of the repetitions performed. Whenever an individual could perform more than the prescribed number of repetitions for all sets of a given exercise, the resistance intensity for that particular exercise was increased. Frequency of the training program was two sessions per week with at least 72 hours of rest between sessions. A total of 24 sessions was performed along the 12-week training period with all sessions occurring between seven and eight a.m. Prior to each training session, the participants performed a specific warm up, consisting of 20 repetitions with approximately 50% of the resistance used in the first exercise of the training session. Ad-

herence to the program was 100.0% for all the groups. (Simao et al, 2010).

ANALYSIS OF THE DATA

The data collected from the experimental groups and control group on prior and after experimentation on selected variables were statistically examined by analysis of covariance (ANCOVA) was used to determine differences, if any among the adjusted post test means on selected criterion variables separately.

Whenever they obtained f-ratio value was significant the Scheffe's test was applied as post hoc test to determine the paired mean differences, if any. In all the cases .05 level of significance was fixed.

The Analysis of covariance (ANCOVA) on Explosive power in vertical direction (EPVD) and Explosive power in horizontal direction (EPHD) of Experimental Groups and Control group, have been analyzed and presented in Table -1.

Table - 1
Values of Analysis of Covariance for Experimental Groups and Control Group on Selected Explosive power Parameters

Certain Variables	Adjusted Post test Means			Source of Variance	Sum of Squares	df	Mean Squares	'F' Ratio
	LG-SM Group (I)	SM-LG Group (II)	Control Group (III)					
Explosive power in vertical direction (EPVD)	51.60	49.12	44.54	Between With in	384.00 167.94	2 41	192.00 4.10	46.87*
Explosive power in horizontal direction (EPHD)	2.22	2.09	1.96	Between With in	0.50 0.08	2 41	0.25 0.002	125.19*

* Significant at .05 level of confidence

(The table value required for Significance at 0 .05 level with df 2 and 41 is 3.23)

Table 1 shows that the adjusted post test mean value of Explosive power in vertical direction (EPVD) and Explosive power in horizontal direction (EPHD) for large and progressed toward small muscle group exercises group (LG-SM), small and advanced to large muscle group exercises group (SM-LG) and Control Group, are 51.60, 49.12, 44.54, 2.22, 2.09 and 1.96 respectively. The obtained F-ratio 46.87 and 125.19 for the adjusted post test mean is more than the table value 3.23 for df 2 and 41 required for significance at .05 level of confidence.

The results of the study indicate that there is a significant difference among the adjusted post test means of Experimental Groups and Control Group on the increase of Explosive power in vertical direction (EPVD) and Explosive power in horizontal direction (EPHD).

To determine which of the paired means had a significant differences, Scheffe's test was applied as Post hoc test and the results are presented in Table 2.

Table - 2
The Scheffe's test for the differences between the adjusted post tests paired means on Selected Explosive power Parameters

Certain Variables	Adjusted Post test Means			Mean Difference	Confidence Interval
	LG-SM Group (I)	SM-LG Group (II)	Control Group (III)		
Explosive power in vertical direction (EPVD)	51.60	49.12		2.48*	1.85
	51.60		44.54	7.06*	1.85
		49.12	44.54	4.58*	1.85
Explosive power in horizontal direction (EPHD)	2.22	2.09		0.13*	0.04
	2.22		1.96	0.26*	0.04
		2.09	1.96	0.13*	0.04

* Significant at .05 level of confidence

Table 2 shows that the adjusted post test mean for differences on LG-SM group and SM-LG group, LG-SM group and Control group, SM-LG group and Control group on Explosive power in vertical direction (EPVD) are 2.48, 7.06 and 4.58 respectively. The values are greater than the confidence interval value 1.85, which shows significant differences at .05 level of confidence.

Further the table 2 shows that the adjusted post test mean for differences on LG-SM group and SM-LG group, LG-SM group and Control group, SM-LG group and Control group on Explosive power in horizontal direction (EPHD) are 0.13, 0.26 and 0.13 respectively. The values are greater than the confidence interval

value 0.04, which shows significant differences at .05 level of confidence.

It is concluded from the results of the study that there is a significant difference in Explosive power in vertical direction (EPVD) and Explosive power in horizontal direction (EPHD) between the adjusted post test means of LG-SM group and SM-LG group, LG-SM group and Control group, SM-LG group and Control group. However, the improvement in Explosive power in vertical direction (EPVD) and Explosive power in horizontal direction (EPHD) is significantly increased for LG-SM group than SM-LG group and Control group.

Therefore it may be concluded that the LG-SM group is found to be better than the SM-LG group and Control group in improving Explosive power in vertical direction (EPVD) and Explosive power in horizontal direction (EPHD).

The adjusted post test means values of experimental groups and the control group on Explosive power in vertical direction (EPVD) and Explosive power in horizontal direction (EPHD) are graphically represented in the Figure -1 and Figure-2.

Figure 1
BAR DIAGRAM ON ORDERED ADJUSTED MEANS OF EXPLOSIVE POWER IN VERTICAL DIRECTION (EPVD) IN CENTIMETERS

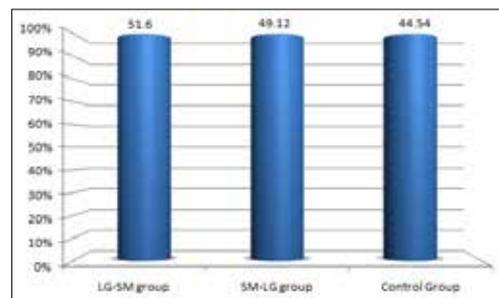
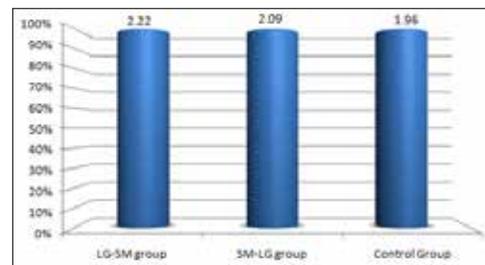


Figure 2
BAR DIAGRAM ON ORDERED ADJUSTED MEANS OF EXPLOSIVE POWER IN HORIZONTAL DIRECTION (EPHD) IN METERS



CONCLUSION

From the results, it is concluded that the Large and progressed toward small muscle group exercises (LG-SM) group, small and advanced to large muscle group exercises (SM-LG) group showed significant improvement on power related parameters such as

Explosive power in vertical direction (EPVD) and Explosive power in horizontal direction (EPHD) among Anna University men Soccer players. The study concluded that Large and progressed toward small muscle group exercises (LG-SM) group is better than other groups for improving the selected power parameters.

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