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EFFECT OF PLYOMETRIC TRAINING ON SELECTED ANTHROPOMETRIC VARIABLES OF STATE LEVEL VOLLEYBALL PLAYERS

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Abstract :

The purpose of the study is to find out the effects of plyometrics training on selected anthropometric variables of state level volleyball players. The subjects are 30 volleyball men players. The age of subjects ranged between 18-23 year. The experiment group consist of 15 players and control group consist also 15 players. The initial test and final test scores on the selected anthropometric variables .i.e upper arm girth, forearm girth, thigh girth and calf girth, have been taken before and after the plyometric training of six weeks for experimental group. The training programme for the experimental group is

administered three times a week for 30-45 min. for a period of six weeks. The plyometric training programme consists depth jump, over and under with medicine ball, situps throw, hurdle jump, supine two arms over head throw on Monday, Wednesday and Friday. To find out the significance of differences between initial test and final tests means and among the experimental group and control group in selected anthropometric variables coefficient of correlation has been analysed. The level of significance is chosen to be 0.05.

KEYWORDS: Plyometrics Training, Anthropometric variables, Neuro-muscular functions, Girth, Hypertrophy.

INTRODUCTION

Sports are a worldwide phenomenon today. The need and of performance in sports has increased rapidly in the last few decades. In no period of world history was a sport so popular, organized and important as it is today. It has a very prominent role in modern society. It is important to an individual, a group, a nation and indeed the world. Throughout the world sports has a popular appeal among people of all ages and both sexes. According to Arnhem(1985) now a day specific training has been playing a predominant role with emergency of different method having sustained scientific knowledge for outstanding achievement in various levels of competition. The sportsman is able to achieve a high level of performance by concentrating on major areas like physical power, physiological efficiencies, psychological development, application of bio mechanics and environment adjustments. A training program is the essence of the sports performance. The coaches make



effort to improve through systematic manipulation of repetitions of movements, intensity of performance and duration of exercises. Sports performance is not a single component. It includes strength, speed, flexibility, coordinative ability, technique and tactics.

During the last few decades, sports training as an object of scientific research has attracted more scholars from various fields of knowledge than ever before. To mention a few, the most important contribution of sports medicine to the problem of human performance lies primarily in the area of performance and metabolism in its most extended meaning and more in physiology and pathology of apparatus of motion. Theory and practice have soon shown that there are large scale differences between possibilities of various organic systems, with regard to their development through training and with regard to the physiological limits of sportsmen.

Plyometric training began systematically in East European countries with the high jumpers, triple jumpers and sprinters in 1950's. The training effect of plyometric is not yet completely understood, the increase in muscle strength and power may be attributed to an increase in muscle elasticity and adaptation in neuromuscular functions.

Plyometric training is one of the best methods to develop explosive power of sports. Basically, plyometric provides a method to train for the optimum relationship between strength and speed which will ultimately manifest itself as explosive power. Today, plyometric movements are performed in almost all the sports. For example, jumping high in volleyball or spike or blocking, start accelerations in football, sprints for jumpers and throwers, weight lifters and gymnasts.

Muscular power, specifically of legs, arms and fingers is the important requirement of a Volleyball player. Spiking contributes 44% of the game which is the outcome of muscular power of the legs and arms. Sudden power thrusts are frequently necessary throughout the game. Superior leg strength is necessary for vertical jump.

Blume (1989) also agrees on the importance of explosive strength and states that rapid attack and defense movements suggest a solid development when force is involved. Therefore, strength in which multiple aspects of rapid, explosive and reactive strength are extremely important in the volleyball.

STATEMENT OF THE PROBLEM

The purpose is to study the effect of plyometric training on selected anthropometric variables of state level volleyball players.

DELIMITATION

- The study is delimited to 30 state level volleyball men players aged 18-23 years.
- The study is confined to selected anthropometric variables.
- It is further delimited to 6 weeks plyometric training programme.

LIMITATION

Non availability of sophisticated instruments for measuring different variables, no special motivational techniques and different socio-economic groups were limitations to the study.

HYPOTHESIS

It is hypothesized that there would not be significant differences in the effects of plyometric training on selected anthropometric variables.

SIGNIFICANCE OF THE STUDY

The study will provide guidelines for preparing scientific training schedule or modifying the old ones for training the volleyball players.

It will help the professionals by the way of highlighting the effects of plyometrics on selected anthropometric variables.

METHODOLOGY

For the purpose of the study 30 men state level volleyball players aged 18-23 years are selected as subjects. All the subjects are assigned in two groups: one experimental group and one control group of 15 players each.

SELECTION OF VARIABLES

The following anthropometric variables are selected for the study:

- Upper arm girth
- Forearm girth
- Thigh girth
- Calf girth

ADMINISTRATION OF TEST

All the measurements of anthropometric variables are recorded by a flexible steel tape in nearest of centimeters.

TABLE 1
TRAINING SCHEDULE FOR THE EXPERIMENTAL GROUP

Sr.No.	Day	Plyometric Training
1.	Monday	Depth jump, over and under with medicine ball, sit-ups throw ,hurdle jump, supine two arms over head throw
2.	Tuesday	Rest
3.	Wednesday	Depth jump, over and under with medicine ball, sit-ups throw, hurdle jump, supine two arms over head throw
4.	Thursday	Rest
5.	Friday	Depth jump, over and under with medicine ball, sit-ups throw, hurdle jump, supine two arms over head throw
6.	Saturday	Rest

PLYOMETRIC TRAINING PROGRAMME

Subjects are trained thrice a week.i.e. on Monday, Wednesday and Friday 7:30-9:00 am for period of 6 weeks. In 1-2 weeks subjects perform 10 repetitions of all the exercises in 2 sets of 35-45 intensity with 3-5 min recovery in between. During 3-4 weeks all the exercises are performed in 14 repetitions of 3 sets each of 45-60% intensity with 3-5 min recovery in between.In the 5-6 week students perform all the exercises 3 sets in of 20 repetitions each of 60-80% intensity with 4-6 min rest inbetween.

STATISTICAL PROCEDURE

In order to find out the effect of plyometric training on selected anthropometric variables of state level volleyball players, product moment correlation coefficient is employed. The hypothesis is tested at .05 level of confidence.

SUMMARY

The purpose of the present study is to find the effects of plyometric training on selected anthropometric variables of state level volleyball players from Lucknow. The age of subjects between 18-23 year, the subjects are 30 volleyball state level men players. The experiment group consists of 15 players.

FINDINGS

In order to find the relationship of plyometric training with the selected anthropometric variables after administering the training treatment, the initial and final test score are collected, the initial and final scores are analyzed using coefficient of correlation.

The coefficient of correlation for the experimental group and control group in upper arm girth indicates a 'r' value of 0.95 and 0.90 which indicates a significant difference from the initial to final test means among groups.

The coefficient of correlation for the experimental group and control group in forearm girth indicates a 'r' value of 0.93 and 0.90 which indicates a significant difference from the initial to final test means among groups.

The coefficient of correlation for the experimental group and control group in thigh girth indicates a 'r' value of 0.96 and 0.86 which indicates a significant difference from the initial to final test means among groups.

The coefficient of correlation for the experimental group and control group in calf girth indicates a 'r' value of 0.89 and 0.75 which indicates a significant difference from the initial to final test means among groups.

DISCUSSION OF THE FINDINGS

The findings pertaining to the study revealed significant improvement in the entire selected anthropometric variables. i.e. upper arm girth, forearm girth, thigh girth and calf girth. A significant difference has been found in upper arm and forearm girth for the experimental group. The movement involved in medicine ball through give load directly to the muscles of the arm. Throwing, gripping and other movement with the medicine ball gives load to the biceps brachialis, brachioradialis, extensor carpi, radialis longus of the forearm group of muscles as these muscles are the agonist and antagonist muscles involved in the medicine ball throw apart from other muscles. The six week training might have given load on these muscles leading to the hypertrophy of the muscles which might be basically due to the increase capillaries density.

A significant difference has been found in calf girth for the experimental group. The increase in calf girth after six weeks of training is quite obvious as depth jump and hurdle jump are directly giving load on the muscles of the calf. This explosive strength type of load on the gastrocnemius muscles leads to hypertrophy of the muscles in the same manner as the hypertrophy of upper arm girth took place.

A significant difference has been found in thigh girth for experimental group. The hypertrophy of quadriceps and hamstring groups of muscles might have been due to the depth jump and hurdle jump used in six weeks of plyometric training.

DISCUSSION OF HYPOTHESIS

On the basis of the results, the hypothesis that there would not be any significant differences in the effect of plyometric training on selected anthropometric variables such as upper arm girth, forearm girth, thigh girth and calf girth of state level volleyball players have been rejected.

CONCLUSION

On the basis of the findings of the study the following conclusion may be drawn: Six weeks of plyometric training is effective in improving upper arm girth, forearm girth, thigh girth and calf girth of state level volleyball players.

Six weeks of planned and systematic training programme is beneficial in improving the state level volleyball players.

RECOMMENDATIONS

On the basis of the finding of the study and the conclusions drawn the following recommendations are made:

- The study may be conducted in different games and sports where power is a dominating factor.
- A long term study of a similar nature may also be undertaken to find out the effect of plyometric training programme. The duration of such study may vary from six months to one year or longer.
- Further studies may be undertaken with larger sample in various track and field events games and sports.
- A similar study with subjects of different age group and opposite sex may be undertaken.

APPENDIX-1

Initial Test & Final Test Scores of the experimental group & control group on Upper Arm, Fore Arm Girth:

Sr.No.	UPPER ARM GROUP				FORE ARM GROUP			
	Experimental group		Control group		Experimental group		Control group	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1.	29	30	22	23	26	28	25	24
2.	27	29	27	28	24	25	26	25
3.	30	30	26	26	27	28	26	25
4.	21	23	24	25	23	25	27	26
5.	25	26	28	29	25	26	24	22
6.	24	26	25	25	23	26	25	23
7.	25	27	26	27	24	25	27	26
8.	26	28	27	28	25	27	23	22
9.	29	30	26	25	29	29	25	24
10.	28	28	24	22	27	28	24	23
11.	24	26	25	24	26	28	24	24
12.	25	26	28	29	24	26	23	22
13.	29	30	24	24	25	27	26	25
14.	23	25	27	29	27	28	27	25
15.	26	26	26	26	24	25	24	24

APPENDIX-2

Initial Test & Final Scores of the experimental group & control group on Thigh, Calf Girth:

Sr.No.	THIGH GIRTH				CALF GIRTH			
	Experimental group		Control group		Experimental group		Control group	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1.	53	55	53	53	35	36	33	32
2.	50	52	49	50	34	34	35	33
3.	54	55	55	53	37	38	34	34
4.	47	49	46	48	32	34	36	36
5.	48	50	49	50	35	35	37	34
6.	46	49	49	47	31	33	38	36
7.	45	49	46	46	34	35	36	35
8.	46	47	48	47	36	38	30	32
9.	51	53	51	49	33	34	32	31
10.	48	49	49	47	32	34	33	33
11.	55	56	47	47	31	34	34	35
12.	47	49	45	46	37	37	32	30
13.	50	52	46	47	35	37	30	32
14.	48	51	50	51	32	34	34	36
15.	49	51	49	49	34	35	36	37

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