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Effect of vascular occlusion training on muscles among the students of Chandigarh

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Abstract

This study will be helpful for the youth as they are more inclined towards harmful drugs and steroids to increase their Muscle Strength. The Vascular Occlusion Training can not only help them in increasing their Muscle Size, but also it can be a new stimulus, especially in lagging Muscles. Generally lagging Muscles have restricted Blood Flow, which limits their growth potential. Blood flow to a Muscle is also a key for quicker recovery. By flooding the lagging muscle with higher than normal levels of blood and growth hormones (GH) their growth potential increases. The design of the study was an action research intended to solve the problem faced by students of the Post Graduate Government College, Sector -11, Chandigarh. In this research, experimental method was adopted. Further the true experimental design having pre and post randomized Control Group was employed in the study. There were two Experimental Groups and a Control Group of 9 subjects in each group. The Experimental Group 1 - Vascular Occlusion Training, the Experimental Group 2 - High Intensity Group was given Vascular Occlusion Training for four weeks and the control group was providing light weight training without any Occlusion. This training was given in temperature of 24 °C to 28 °C. A training session were of 45 minutes duration and done five days in a week. Vascular Occlusion Training (VOT) can become a better option in the future to improve fitness component i.e. Muscular Strength.

Keywords: Occlusion, vascular, weight training, effect, muscular strength

1. Introduction

Fitness professionals have invented many techniques and on the other hand it has also invented many new technology and machines that has made one's life happier and easier. But the matter of concern is in our country some more inventions are yet to be discovered to overcome the challenges faced by professionals. Every player gone through such a stage where he suffers many injuries he has to suffer for many years and it also decreases the performance level of the player. In today's era we need such technology and get these types of injuries. Every player knows about their maximum capacity, but their maximum capacity, but they can't utilize it completely for example, any weight lifter knows that he can lift up to 100 kg of weight but he can't perform efficiently. He only gives his 70 to 80%. To further improve his capacity, him do a lot of hard work. But to perform efficiently and to get results faster, player more on a wrong track they started taking drugs, harmful supplements, to take training without any knowledge. Today we need some system through which player improves their performance as well as their mental health. As we all know this very well in physical performance well explosive strength or power plays a vital role in our body. For example, when any sprints need to perform it is not necessary that it also have maximum Strength or Power. On the other hand non-sports person also needs strength and power in their physical activity. In other words, we can conclude that either the person is sports person or a non-sports person they need Muscular Strength in their performance by effective training methods. They should include these methods in their effective training. Skeletal Muscles are those which attach to bones and have the main function of contracting to facilitate movement of our skeletons. They are also sometimes known as striated muscles due to their appearance. The cause of the striped appearance is the bands of Actin and Myosin which form the Sarcomere, found within the Myofibrils. Skeletal muscles are also sometimes called voluntary muscles, because we have direct control over them through nervous impulses from our brains sending messages to the

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Muscle. Contractions can vary to produce powerful, fast movements or small precision actions. Skeletal muscles also have the ability to stretch or contract and still return to their original shape.

Vascular Occlusion Training is a different type of a training which help in increasing strength and power/ but also in increasing Strength. There is a lot difference in how people used to think about fitness in the past and what they think now. The main benefit of Vascular Occlusion Training is that it actually allows the body to respond to low level intensity exercise (best used for fat loss) in the same way it does to moderate intensity exercise best used for Muscular Strength.

2. Methods

The design of the study was an action research intended to solve the problem faced by students of the Post Graduate Government College, Sector -11, Chandigarh. In this

research, experimental method was adopted. Further the true experimental design having pre and post randomized control group was employed in the study. There were two experimental groups and a control group of 9 subjects in each group. The experimental group 1 - Vascular Occlusion Training, the experimental group 2 - High Intensity Group was given Vascular Occlusion Training (VOT) for four weeks and the control group were provided light weight training without any Occlusion. This training was given in temperature of 24°C to 28°C. A training session were of 45 minutes duration and done five days in a week as per the module given below:-

Training Schedule for the Students receiving Vascular Occlusion Training

Day 1

Exercise	Sets	Repetitions	Rest	Intensity
Front Squat	4	5/5/5/5	30 Sec.	30%
Good Morning	3	6/6/6	30 Sec.	30%
Occlusion Leg Extension	4	30/15/15/15	30 Sec.	30 %
Occlusion Leg Curl	4	30/15/15/15	30 Sec.	30%

Day 2

Exercise	Sets	Repetitions	Rest	Intensity
Close – Grip Barbell Bench Press	4	5/5/5/5	30 Sec.	30%
Lateral Raise	3	12/12/12	30 Sec.	30%
Chin Up	3	3/3/3	30 Sec.	30 %
Occlusion Dumbbell Curl	4	30/15/15/15	30 Sec.	30%
Occlusion Triceps press Down	4	30/15/15/15	30 Sec.	30%

Day 3

Exercise	Sets	Repetitions	Rest	Intensity
Bodyweight Squat	4	8/8/8/8	30 Sec.	30%
Barbell Dead Lift	3	4/4/4/4	30 Sec.	30%
Reverse Lunge	2	8/8	30 Sec.	30 %
Occlusion Leg Extension	4	30/15/15/15	30 Sec.	30%
Occlusion Seated Leg Curling	4	30/15/15/15	30 Sec.	30%

Day 4

Exercise	Sets	Repetitions	Rest	Intensity
Incline Barbell Bench Press	4	8/8/8/8	30 Sec.	30%
Chest Supported Row	4	10/10/10/10	30 Sec.	30%
Cable Lateral Raise	3	8/8/8	30 Sec.	30 %
Occlusion EZ- Barbell Curl	4	30/15/15/15	30 Sec.	30%
Occlusion V-Bar Triceps Press Down	4	30/15/15/15	30 Sec.	30%

Day 5

Exercise	Sets	Repetitions	Rest	Intensity
Decline Barbell Bench Press	4	5/5/5/5	30 Sec.	30%
Let Pull Down	3	8/8/8	30 Sec.	30%
Push Up	3	12/12/12	30 Sec.	30 %
Occlusion Hammer Curl	4	30/15/15/15	30 Sec.	30%
Occlusion Scull Crush Extension	4	30/15/15/15	30 Sec.	30%

3. Stastical technique

In order to examine the hypotheses of the study Mean, Standard Deviation (SD) Standard error of the mean and Analysis of covariance (ANCOVA) test was used. Where the 'F' value found were significant and (LSD) Least Significant Difference Post Hoc Test was used. The level of the

significance was set at 0.05.

4. Results and discussion

The results of the three Groups, i.e., Two Experimental Groups and one Control Group are shown in the following section.

Table 1: Mean and Standard Deviation of different Training Groups measured during Post Test on Chest Strength

Group	Mean	N	Std. Deviation
Experimental Group - Vascular Occlusion Training	56.94	09	10.13
Experimental Group – High Intensity Training	65.55	09	15.04
Control Group	46.94	09	9.22

The mean and the standard deviation of different groups during post testing has been presented in the table -1, the mean scores of the male students of Experimental Group-Vascular Occlusion Training group during the post test on Chest Strength is 56.94 and the standard deviation is 10.13,

the mean score of male students of Experimental Group- High Intensity Training during the post test on Chest Strength is 65.55 and the standard deviation is 15.04. The mean score of male students of Control Group during the post test on Chest Strength is 46.94 and the standard deviation is 9.22

Table 2: Adjusted mean scores, Std. Error of the different training groups during the Post Test on Chest Strength

Groups	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Experimental Group –Vascular Occlusion Training	57.85 ^a	1.04	55.70	60.00
Experimental Group- High intensity Training	58.69 ^a	1.10	56.40	60.98
Control Group	52.89 ^a	1.09	50.63	55.15

a. Covariates appearing in the model are evaluated at the following values: Pre test scores on strength of chest = 53.22.

Further, the adjusted mean scores of the male Students of Experimental Group – Vascular Occlusion Training during the Post test on Chest Strength is 57.85 with the standard error is 1.04, The adjusted mean scores of the male Students of Experimental Group - High Intensity Training during the post

test on Chest Strength is 58.69 with the standard error is 1.10, The mean scores of the male Students of Control Group on Chest Strength during the post test is 52.8 with the standard error is 1.09, these values are different from that of the unadjusted values shown in table 2, this shows that the effect of covariant (Pre-test) is eliminated in comparing the effectiveness of the treatment in the post testing.

Table 3: Ancova Summary of three groups on Chest Strength

Source	Type III Sum of Squares	DF	Mean Square	F	Sig.
Corrected Model	4650.51 ^a	3	1550.17	159.72	.000
Intercept	84.25	1	84.25	8.68	.007
PSC	3088.94	1	3088.94	318.27	.000
GROUPS	150.58	2	75.29		
Error	223.22	23		7.75	.003
Total	91008.0	27	9.70		
Corrected Total	4873.74	26			

R Squared = .954 (Adjusted R Squared = .94)

The Table 3 shows that the f - value 7.75 after comparing the adjusted mean scores of all the three groups of the students of the Post Graduate Govt College during the Post test on chest Strength. The f-value 7.75 is significant at 0.05 level of significance, with the degree of freedom (2, 23). It may

therefore be said that the three groups differ significantly on their Chest Strength. In order to see the direction of differences LSD Post Hoc test was used and the scores are presented in the following table.

Table 4: Pairwise comparison of three different groups during Post-test on Chest Strength

(I) Groups	(J) Groups	Mean Difference (I-J)	Std. Error	Sig. ^a
Experimental Group - Vascular Occlusion Training	Experimental Group -High Intensity Training	-.84	1.53	.58
	Control Group	4.95*	1.49	.00
Experimental Group - High intensity Training	Experimental Group -Vascular Occlusion Training	.84	1.53	.58
	Control Group	5.80*	1.63	.00
Control Group	Experimental Group -Vascular Occlusion Training	-4.95*	1.49	.00
	Experimental Group - High Intensity Training	-5.80*	1.63	.00

Based on estimated marginal means

a. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

*. The mean difference is significant at the.05 level.

The table:4 suggests that there is significance difference between the mean score of male students given Vascular Occlusion Training and the mean score of male students from control group, the mean scores of male students given Vascular Occlusion Training during post-test on Chest

Strength is 57.85 and the mean score of male students of control group during post-test on Chest Strength is 52.87, It may therefore be said that the male students given Vascular Occlusion Training have better Chest Strength as compare to the male students from control group, the mean scores of male

students given High Intensity Training during post-test on Chest Strength is 58.69 and the mean score of male students of control group during post-test on Chest Strength is 52.87, It may therefore be said that the male students given High Intensity Training have better Chest Strength as compare to the male students from control group, the mean scores of male students given Vascular Occlusion Training during post-test on Chest Strength is 57.85 and the mean score of male

students of High Intensity Training during Post-test on Chest Strength is 58.69, whereas no significant difference between the mean scores of male students given Vascular Occlusion Training during post-test and the mean score of the students given High Intensity Training during the post test on Chest Strength. It may therefore be said that both the group have equal to Chest Strength.

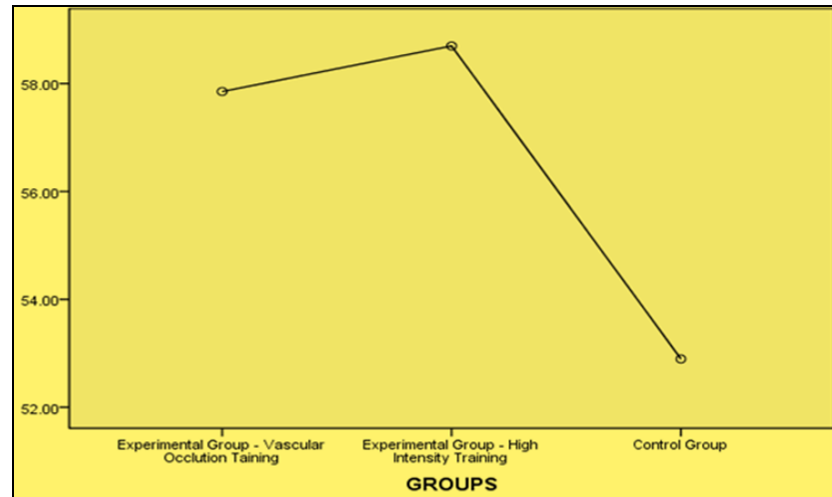


Fig 1: Estimated Marginal Means of Post test scores on Chest Strength

Discussion of the findings

On the basis of the results it may be said that Vascular Occlusion Training is very effective in the improvement of different characteristic of Muscles. The training has shown significant improvement in Chest Strength. Beaven (2014) ^[2] examined Occlusion training can potentially improve the rate of strength-training gains and fatigue resistance in training athletes, possibly allowing greater gains from lower loading that could be of benefit during high training loads, in competitive seasons, or in a rehabilitative setting. The clear improvement in bench-press strength resulting from lower-body occlusion suggests a systemic effect of Vascular Occlusion Training (BFR) training.

Conclusions

After the analysis of data the following conclusion is drawn:

1. It may therefore be said that the male students given Vascular Occlusion Training have better Chest Strength as compare to the male students from Control Group.
2. No significance difference between the mean scores of male students given Vascular Occlusion Training and the mean score of the students given High Intensity Training on Chest Strength. It may therefore be said that both the group has statistically equal Chest Strength.

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