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Research Paper

Isolated and Combined Effect of Theraband Resistance Exercise and Medicine Ball Exercise of Selected Biochemical Variables of School Boys

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Abstract

The purpose of the study was to find the effect of isolated and combined effect of Theraband resistance exercise and Medicine ball exercise on selected bio chemical variables of school boys. To facilitate the study 80 boys from Army Public School, Trivandrum District were randomly selected as subjects and their age was between 14 and 15 years. The study was formulated as a true random group design, consisting of a pre test mid test and post test. To find out the difference between the pre test, mid test and post test, repeated measures ANOVA was used. Whenever it found significant, the Newman kuels post-hoc test was administered. Analysis of covariance (ANCOVA) was applied and whenever the adjusted post-test means were found significant, the scheffe's post-hoc test was administered to find out the paired means difference. The result reveals that the combined group (Theraband resistance exercise and Medicine ball exercise) have shown increased level of hemoglobin content and RBC than the Theraband resistance exercise, Medicine ball exercise and control group.

Keywords: Theraband resistance exercise, Medicine ball exercise, RBC, Hemoglobin.

Introduction

Theraband resistance bands are widely used for rehabilitation from muscle and joint injuries and for aerobics and general conditioning. Proper use of these bands for resistive exercise provides both positive and negative force on the muscles, improving strength, range of motion and cooperation of muscle groups. Color-coded progressive resistance gives at-a-glance documentation of progress from one level to the next.

Medicine ball exercises have their place in an overall strength program. That doesn't mean to say they should replace all forms of strength training however. Rather than following a medicine ball 'routine' as such, a more appropriate approach is to select a few exercises and incorporate them into a circuit or session designed to increase power and/or strength endurance.

Purpose of the Study

The purpose of the study was to compare the effect of Theraband resistance exercise and medicine ball exercise and combined effect of Theraband resistance exercise and Medicine ball exercise on selected biochemical variables.

Methodology

Selection of Subjects

To facilitate the study 80 boys students from Army Public School, Trivandrum District were randomly selected as subjects and their age was between 14 and 15 years. They were assigned into four groups of which one group served as Theraband Resistance exercise groups, second group served as Medicine Ball exercise group, third group served as combined Theraband Resistance exercise and Medicine Ball exercise group and the fourth group served as control group.

Selection of Variables

The research scholar reviewed the various scientific literatures pertaining to the Theraband Resistance exercise and Medicine ball exercises on selected biochemical variables from books, journals, periodicals, magazines and research papers. Taking into consideration of feasibility criteria, availability of instruments and the relevance of the variables of the present study, the biochemical variables Hemoglobin content and RBC were selected.

Results and Discussions

TABLE - 1

ONE WAY REPEATED MEASURES ANOVA ON SELECTED VARIABLES OF PRE, MID AND POST TESTS OF THERABAND TRAINING GROUP

Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained 'F'-ratio
RBC	Between	0.60	2	0.30	173.89*
	Error	0.06	38	0.002	
Haemoglobin	Between	1.64	2	0.82	117.02*
	Error	0.26	38	0.007	

* Significant at 0.05 level. The table value required for significance at 0.05 level with df 2 and 38 is 3.24.

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TABLE - 2

ONE WAY REPEATED MEASURES ANOVA ON SELECTED VARIABLES OF PRE, MID AND POST TESTS OF MEDICINE BALL EXERCISES GROUP

Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained 'F'-ratio
RBC	Between	2.45	2	1.22	346.85*
	Error	0.13	38	0.004	
Haemoglobin	Between	8.65	2	4.32	941.15*
	Error	0.17	38	0.005	

* Significant at 0.05 level. The table value required for significance at 0.05 level with df 2 and 38 is 3.24.

TABLE - 3

ONE WAY REPEATED MEASURES ANOVA ON SELECTED VARIABLES OF PRE, MID AND POST TESTS OF COMBINED EXERCISES GROUP

Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained 'F'-ratio
RBC	Between	5.29	2	2.64	165.67*
	Error	0.60	38	0.01	
Haemoglobin	Between	23.88	2	11.94	648.48*
	Error	0.70	38	0.01	

* Significant at 0.05 level. The table value required for significance at 0.05 level with df 2 and 38 is 3.24.

TABLE - 4

ONE WAY REPEATED MEASURES ANOVA ON SELECTED VARIABLES OF PRE, MID AND POST TESTS OF CONTROL GROUP

Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained 'F'-ratio
RBC	Between	0.006	2	0.003	0.08
	Error	1.50	38	0.03	
Haemoglobin	Between	0.001	2	0.001	1.00
	Error	0.02	38	0.001	

* Significant at 0.05 level. The table value required for significance at 0.05 level with df and 38 is 3.24.

TABLE – 1.1

NEWMAN KEULS TEST FOR THE DIFFERENCES BETWEEN TREATMENT MEANS ON BIOCHEMICAL VARIABLES OF THERABAND EXERCISES GROUP

	Means		Order Means			Range (r)	Critical value
			Post	Mid	Pre		
RBC			4.79	4.67	4.54		
	Post	4.79	-	0.12*	0.25*	3	0.0
	Mid	4.67	-		0.13*	2	0.0
	Pre	4.54	-	-	-	-	-
			Post	Mid	Pre		
			13.34	13.14	12.94		
Hemoglobin	Post	13.34	-	0.20*	0.40*	3	0
	Mid	13.14	-		0.20*	2	0
	Pre	12.94	-	-	-	-	

*Significant at 0.05 level.

TABLE – 2.1

NEWMAN KEULS TEST FOR THE DIFFERENCES BETWEEN
TREATMENT MEANS ON BIOCHEMICAL VARIABLES OF MEDICINE EXERCISES GROUP

Means			Order Means			Range (r)	Critical value
			Post	Mid	Pre		
			4.93	4.67	4.44		
RBC	Post	4.93	-	0.26*	0.49*	3	0.07
	Mid	4.67	-		0.23*	2	0.06
	Pre	4.44	-	-	-	-	-
Hemoglobin			Post	Mid	Pre		
			13.88	13.43	12.95		
	Post	13.88	-	0.45*	0.93*	3	0.07
	Mid	13.43	-		0.48*	2	0.06
	Pre	12.95	-	-	-	-	-

*Significant at 0.05 level.

TABLE – 3.1

NEWMAN KEULS TEST FOR THE DIFFERENCES BETWEEN
TREATMENT MEANS ON BIOCHEMICAL VARIABLES OF COMBINED GROUP

	Means		Order Means			Range (r)	Critical value
			Post	Mid	Pre		
			5.20	4.78	4.47		
RBC	Post	5.20	-	0.42*	0.73*	3	0.11
	Mid	4.78	-		0.31*	2	0.09
	Pre	4.47	-	-	-	-	-
		Post	Mid	Pre			
			14.40	13.69	12.89		
	Post	14.40	-	0.71*	1.51*	3	0.11
Hemoglobin	Mid	13.69	-		0.80*	2	0.09
	Pre	12.89	-	-	-	-	-

*Significant at 0.05 level.

Computation of Analysis of co variance

The subjects were selected random, but the groups were not equated in relation to the factors to be examined, Hence the difference between means of the four groups in the pre-test had to be taken into account during the analysis of the post-test differences between the means. This was achieved by the application of the analysis of covariance, where the final means were adjusted for differences in the initial means, and the adjusted means were tested for significance. When ever the adjusted post-test means were found significant, the Scheffe's post-hoc test was administer to find out the paired means significant difference. The significance of the means of the obtained test results was tested at 0.05 level of confidence. It was considered as sufficient for the present study.

The following tables illustrate the statistical results of the effect of isolated and combined effect of Theraband resistance exercise and Medicine ball exercise on selected bio chemical variables of school boys.

Table – 5

SUMMARY OF ANALYSIS OF VARIANCE FOR THE INITIAL MEANS ON SELECTED VARIABLES OF THERABAND, MEDICINE BALL, COMBINED THERABAND AND MEDICINE BALL AND CONTROL GROUPS

Sl.No.	Variables	Source of Variation	Sum of Squares	DF	Mean Squares	F- Value
1	RBC	Between Sets	0.16	3	0.05	0.68
		Within Sets	6.10	76	0.08	
2	Haemoglobin	Between Sets	1.31	3	0.43	1.26
		Within Sets	26.20	76	0.34	

* Table value for df 3 and 76 was 2.72

Results of initial mean

The F-value obtained from testing the initial means among the four groups on the criter measures were shown in Table 5, the corresponding 'F' values needed for significance at 0 level of confidence was 2.72. The calculated 'F' values are RBC (0.68) and Haemoglobin (1.2 Since the observed F-values of these were found lesser than the required table value of 2.7 0.05 level of confidence, the observed mean difference among the groups on criterion measu was statistically not significant. Thus the obtained results confirm the random assignmen subjects to four groups was successful.

Table – 6

SUMMARY OF ANALYSIS OF VARIANCE FOR THE FINAL MEANS ON SELECTED VARIABLES OF THERABAND, MEDICINE BALL, COMBINED THERABAND AND MEDICINE BALL AND CONTROL GROUPS

Sl.No.	Variables	Source of Variation	Sum of Squares	DF	Mean Squares	F- Value
1	RBC	Between Sets	4.18	3	1.39	20.08 *
		Within Sets	5.28	76	0.07	
2	Hemoglobin	Between Sets	18.89	3	6.29	18.57 *
		Within Sets	25.76	76	0.33	

* Table value for df 3 and 76 was 2.72

Results of Final mean

The F-value obtained from testing the initial means among the three groups on the criterion measures were shown in Table 6, the corresponding 'F' values needed for significance at 0.05 level of confidence was 2.72. The calculated 'F' values are RBC (20.08) and Haemoglobin (18.57) since the observed F-values of these were found greater than the required table value of 2.72 at 0.05 level of confidence, the observed mean difference among the groups on criterion measures was statistically significant.

Table – 7

SUMMARY OF ANALYSIS OF VARIANCE FOR THE ADJUSTED MEANS ON SELECTED VARIABLES OF THERABAND, MEDICINE BALL, COMBINED THERABAND AND MEDICINE BALLAND CONTROL GROUPS

Sl.No.	Variables	Source of Variation	Sum of Squares	DF	Mean Squares	F- Value
1	RBC	Between Sets	4.91	3	1.63	42.36 *
		Within Sets	2.89	75	0.03	
2	Hemoglobin	Between Sets	25.92	3	8.64	369.99 *
		Within Sets	1.75	75	0.02	

* Table value for df 3 and 76 was 2.72

Results of Adjusted Mean

The F-value obtained from testing the initial means among ... measures were shown in Table 7, the corresponding 'F' values needed for significance at 0.05 level of confidence was 2.72. The calculated 'F' values are RBC (42.36) and Hemoglobin (369.99). Since the observed F-values of these were found greater than the required table value of 2.72 at 0.05 level of confidence, the observed mean difference among the groups on criterion measures was statistically significant. It is evident that the criterion measures are influenced by interventions used in the study. Hence the observed mean difference among the four groups was statistically significant. In order to find out which of the pairs of group grown up for the significant difference the Scheffe post-hoc test was applied. The results of the same were given in Table –8

Table – 8

SCHEFFE'S TEST OF SIGNIFICANCE BETWEEN PAIRED FINAL ADJUSTED MEANS FOR BIOCHEMICAL VARIABLES

Sl.No	Physical Variables	Adjusted Means				Mean Differences	CI Value
		TEG	MBEG	TMBEG	CG		
1	RBC	4.76	4.97	—	—	0.21*	0.18
		4.76	—	5.21	—	0.45*	
		4.76	—	—	4.54	0.22*	
		—	4.97	5.21	—	0.24*	
		—	4.97	—	4.54	0.43*	
		—	—	5.21	4.54	0.67*	
2	Hemoglobin	13.40	13.92	—	—	0.52*	0.14
		13.40	—	14.54	—	1.14*	
		13.40	—	—	13.00	0.40*	
		—	13.92	14.54	—	0.62*	
		—	13.92	—	13.00	0.92*	
		—	—	14.54	13.00	1.54*	

* The mean difference for RBC between TEG and MBEG, TEG and TMBEG, TEG and CG, and TMBEG, MBEG and CG, TMBEG and CG were 0.21, 0.45, 0.22, 0.24, 0.43 and 0.67 respe was greater than the CI value 0.18. Hence there exists significant difference between the g

The mean difference for hemoglobin between TEG and MBEG, TEG and TMBEG, TEG and CG, MBEG and TMBEG, MBEG and CG, TMBEG and CG were 0.52, 1.14, 0.40, 0.62, 0.92 and 1.54 respectively was greater than the CI value 0.14. Hence there exists significant difference between the groups.

Discussion on Findings

The Theraband resistance exercises group have shown increased level of haemoglobin content and RBC. Theraband resistance bands are widely used for rehabilitation from muscle and joint injuries and for aerobics and general conditioning. Proper use of these bands for resistive exercise provides both positive and negative force on the muscles, improving strength, range of motion and cooperation of muscle groups.

The medicine ball exercises group have shown increased level of haemoglobin content and RBC. Medicine ball exercises have their place in an overall strength program. Medicine ball exercises used to develop explosive power will be more effective if they are performed after a phase of maximal strength training.

The combined group (Theraband resistance exercise and Medicine ball exercise) have shown increased level of hemoglobin content and RBC than the Theraband resistance exercise, Medicine ball exercise and control group. This may due to the combined effect of both theraband and medicine ball exercises.

Reference

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