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Effects of two different packages of cardiac rehabilitative protocols on total cholesterol, high density lipoprotein, low density lipoprotein and triglycerides levels among coronary artery bypass grafted male patients

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Abstract

Aim of the study: To determine the two different packages of cardiac rehabilitative protocols on Bio-chemical variables among coronary artery bypass graft male patients.

Method of the subject: Experimental design with 45 subjects randomly divided into three equal groups with control, experimental group I and II. The age group was between 45-60 were selected for this study.

Variables: Total Cholesterol, High Density Lipoprotein, Low Density Lipoprotein and Triglycerides Levels.

Result: Since in this study the researcher found that there was good change in the improvement in Ejection Fraction, Oxygen Saturation (PaSO₂) and Anxiety in the Experimental Groups when compared with control group.

Conclusion: Hence it's concluded that that the decreased on biochemical variables such as Total Cholesterol Level, Low Density Lipoprotein, Triglycerides and increased High Density Lipoprotein due to the influence of the two different packages of cardiac rehabilitative protocol among the Coronary Artery Bypass Grafting subjects than the control group.

Keywords: Total Cholesterol, high density lipoprotein, low density lipoprotein and triglycerides levels

Introduction

Cardiovascular disorders are an important public health problem worldwide. They are also the leading cause of mortality and morbidity in the industrialized world. The annual cardiovascular mortality rate was reported as 0.8%. In the United States alone, over 14 million persons suffer from heart disease. In addition, there is evidence of a quick increase in heart disease along the Asian region. It is important to note that the disease accounts for 46% of overall mortality are cardiovascular diseases in Iran. CABG has been used for the treatment of coronary artery disease for nearly 50 years, and has been performed for millions of people worldwide. However, little is known about the impact of lifestyle changes, including diet and exercise, on long-term outcomes in patients who have had coronary artery bypass graft surgery. Cardiovascular disorders are an important public health problem worldwide. They are also the leading cause of mortality and morbidity. Therefore, American Heart Association proposed cardiac rehabilitation program as an essential part of care for cardiac patients to improve functional capacity.

Statement of the Problem: The researcher has decided to take up different combination of packages of cardiac rehabilitative protocols in coronary artery bypass graft patients. Hence the investigator is very much intent to adopt the concept to find out the different packages of cardiac rehabilitative protocols with the variables Bio-chemical variables in coronary artery bypass grafted patients.

Selection of Variables: Total Cholesterol, High Density Lipoprotein, Low Density Lipoprotein and Triglycerides Levels.

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Experimental Design: The subject were selected for this study through the random group design consisting of pre and post test, forty five CABG subjects randomly divided into three groups, the group was assigned as an experimental group I&II and control group

Training Schedules and Supplementation: During the training period, the experimental group underwent incentive spirometry and breathing exercise walking program period of twelve weeks for all days.

Statistical Technique: Analysis of covariance statistical technique was used, to test the significant difference among the treatment groups.

Computation of Analysis of Covariance: The following tables illustrate the statistical results of Effects Of exercise protocols Among CABG and ordered adjusted means and the difference between the means of the groups under study.

Table I: Computation of analysis of covariance of total cholesterol level (Scores in mg/dl)

Test	Control Group	EXP-II	EXP-III	SV	SS	DF	MS	OF	TF
Pre test	206.60	201.33	199.33	B	422.71	2	211.356	1.28	3.1
				W	6944.27	42	165.34		
Post test	193.80	175.73	161.07	B	8064.93	2	4032.47	37.77*	3.1
				W	4484.27	42	106.77		
Adjusted	191.85	176.24	162.51	B	6113.48	2	3056.74	42.13*	3.1
				W	2974.62	41	72.55		
Mean Gain	0.00	25.6	38.27						

*Significant at 0.05 level of confidence for 2and 42 (df) =3.1and 41 (df)=3.1

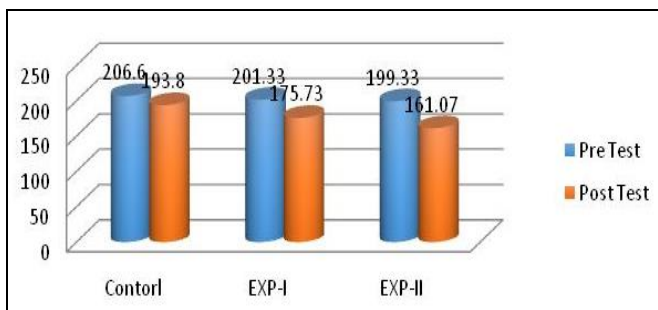


Fig 1: TCL

Results of Total Cholesterol Level

Analyzed data on Total Cholesterol Level. The Pre Test means of Total Cholesterol Level were 206.60 for Control Group, 201.33 for Experimental Group I, and 199.33 for Experimental Group II. The obtained ‘F’ ratio 1.28 was lesser than the table ‘F’ ratio 3.1. Hence, the pre test was not

significant at 0.05 level of confidence for degrees of freedom 2 and 42. The Post Test means were 193.80 for Control Group, 175.73 for Experimental Group I, and 161.07 for Experimental Group II. The obtained ‘F’ ratio 37.77 was higher than the table ‘F’ ratio 2.7. Hence, Post Test was significant at 0.05 level of confidence for the degrees of freedom 2 and 42.

The adjusted Post Test means were 191.85 for Control Group 176.24 for Experimental Group I, 162.51 for Experimental Group II. The obtained ‘F’ ratio 42.13 was higher than the table ‘F’ ratio 3.1. Hence, the adjusted post test was significant at 0.05 levels for the degrees of freedom 2 and 41. The adjusted Post Test means were 2.79 for Experimental Group I, 1.48 for Experimental Group II, and 2.13 for Control Group. The obtained ‘F’ ratio 6.70 was higher than the table ‘F’ ratio 3.1 hence; adjusted post test was significant at 0.05 levels for the degrees of freedom 2 and 42.

Table 2: Computation of analysis of covariance of low density lipoprotein (Scores in mg/dl)

Test	Control	EXP-II	EXP-III	SV	SS	DF	MS	OF	TF
Pre test	144.73	147.4	143.33	B	128.04	2	64.022	0.16	3.1
				W	17191.87	42	409.33		
Post test	139.67	122.46	95.33	B	14987.51	2	7493.76	36.07*	3.1
				W	8726.40	42	207.77		
Adjusted	139.89	121.26	96.31	B	14325.36	2	7162.68	78.33*	3.1
				W	3749.267	41	91.45		
Mean Gain	5.07	24.93	48.00						

*Significant at 0.05 level of confidence for 2and 42 (df) =3.1 and 41 (df)=3.1

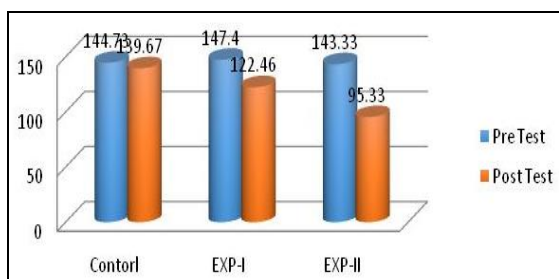


Fig 2: LDL

Results of Low Density Lipoprotein

Table XII shows analyzed data on Low density Lipoprotein.

The Pre Test means of Low density Lipoprotein were 144.73 for Control Group, 147.4 for Experimental Group I, 143.33 for Experimental Group II. The obtained ‘OF’ ratio 0.16 was lesser than the table ‘OF’ ratio 3.1. Hence, the Pre Test was not significant at 0.05 level of confidence for degrees of freedom 2 and 42. The Post Test means were 139.67 for Control Group, 122.46 for Experimental Group I, 95.33 for Experimental Group II. The obtained ‘F’ ratio 36.07 was higher than the table ‘OF’ ratio 3.1. Hence, Post Test was significant at 0.05 level of confidence for the degrees of freedom 2 and 42.

The adjusted Post Test means were 139.89 for Control Group, 121.26 for Experimental Group I, 96.31 for Experimental

Group II. The obtained 'OF' ratio 78.33 was higher than the table 'OF' ratio 3.1. Hence, the adjusted Post Test was

significant at 0.05 level for the degrees of freedom 2 and 41.

Table 3: Computation of analysis of covariance of high density Lipoprotein (Scores in mg/dl)

Test	Control	EXP-I	EXP-II	SV	SS	DF	MS	OF	TF
Pre test	45.87	46.66	49.73	B	124.98	2	62.489	4.05	3.1
				W	648.00	42	15.43		
Post test	46.40	52.26	62.13	B	1896.53	2	948.27	73.45*	3.1
				W	542.27	42	12.91		
Adjusted	46.54	52.33	61.93	B	1529.16	2	764.58	58.36*	3.1
				W	537.13	41	13.10		
Mean Gain	0.53	5.6	12.40						

*Significant at 0.05 level of confidence for 2and 42 (df) =3.1 and 41 (df) =3.1

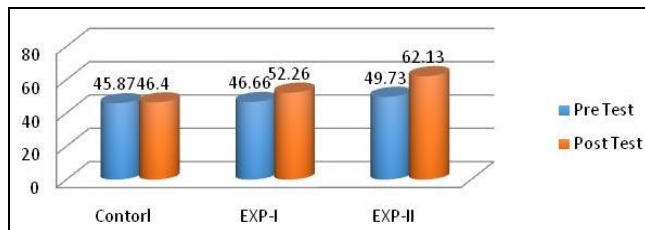


Fig 3: HDL

Results of High Density Lipoprotein

Table XII shows analyzed data on HDL the Pre Test means of HDL were 45.87 for Control Group, 46.66 for Experimental Group I, 49.73 for Experimental Group II. The obtained 'F'

ratio 4.05 was lesser than the table 'F' ratio 3.1. Hence, the pre test was not significant at 0.05 level of confidence for degrees of freedom 2 and 42.

The Post Test means were 46.40 for Control Group, 52.26 for Experimental Group I, 62.13 for Experimental Group II. The obtained 'F' ratio 73.45 was higher than the table 'F' ratio 3.1. Hence, Post Test was significant at 0.05 level of confidence for the degrees of freedom 2 and 42.

The adjusted Post Test means were 46.54 for Control Group, 52.33 for Experimental Group I, 61.93 for Experimental Group II. The obtained 'F' ratio 58.36 was higher than the table 'F' ratio 3.1. Hence, the adjusted post test was significant at 0.05 level for the degrees of freedom 2 and 41.

Table 4: Computation of analysis of Covariance of Triglycerides (Scores in mg/dl)

Test	Control	EXP-II	EXP-III	SV	SS	Df	MS	OF	TF
Pre test	196.67	204.33	195.73	B	668.04	2	334.022	1.30	3.1
				W	10803.60	42	257.23		
Post test	189.60	172.87	159.4	B	6866.98	2	3433.49	29.80*	3.1
				W	4838.93	42	115.21		
Adjusted	190.22	173.75	157.90	B	7541.09	2	3770.55	38.56*	3.1
				W	4009.502	41	97.79		
Mean Gain	7.07	44.93	22.87						

*Significant at 0.05 level of confidence for 2and 42 (df) = 3.1 and 41(df) =3.1

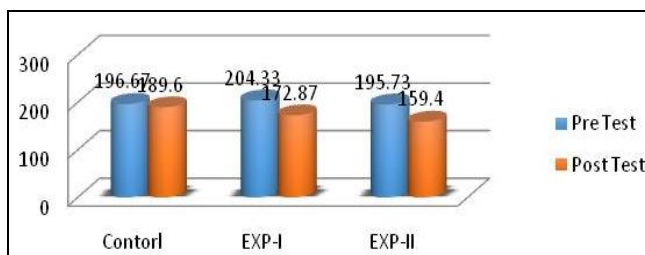


Fig 4: TRL

Results of Triglycerides

Table 3 shows analyzed data on Triglycerides. The Pre Test means of Triglycerides were 196.67 for Control Group, 204.33 for Experimental Group I, 195.73 for Experimental Group II. The obtained 'F' ratio 1.30 was lesser than the table 'F' ratio 3.1. Hence, the Pre Test was not significant at 0.05 level of confidence for degrees of freedom 2 and 42. The Post Test means were 189.60 for Control Group, 172.87 for Experimental Group I and 159.4 for Experimental Group II. The obtained 'F' ratio 29.80 was lesser than the table 'F' ratio 3.1. Hence, the post test was significant at 0.05 level of confidence for degrees of freedom 2 and 42.

The adjusted Post Test means were 190.22 for Control Group, 173.75 for Experimental Group I, 157.90 for Experimental Group II. The obtained 'F' ratio 38.56 was higher than the

table 'F' ratio 3.1. Hence; the adjusted post test was significant at 0.05 levels for the degrees of freedom 2 and 41.

Results of the study: Within the limitations of the study, the following conclusions were drawn:

1. Experimental groups showed significantly greater increase on high density lipoprotein and greater reduction in total cholesterol, low density lipoprotein and triglycerides than that control group at the end of twelve week period of time.
2. Experimental group II showed significantly greater increase on high density lipoprotein and greater reduction in total cholesterol, low density lipoprotein and triglycerides than that Experimental group I at the end of twelve week period of time.

Discussion on findings of total cholesterol, high density lipoprotein, low density lipoprotein and triglycerides levels:

Discussion on Triglyceroids-During the 12 weeks of Cardiac Rehabilitation exercise programme and walking pattern, definitely it will utilize excess of glucose from circulatory process. A healthy person can secrete an increase level of insulin secretion. Better insulin secretion can take maximum blood glucose from blood arteries to form Mitochondrial reaction. At the end of the Krebs cycle reaction, the six carbon glucose into three carbon Acetyl CoA. So the working

muscle can release more volume of chemical energy and thermal energy for the working muscle and a better working muscle can convert excess glucose which is present in the blood tubes. If the excess glucose is utilized by your skeletal muscle, if less chance of forming Low density Lipoprotein in the blood tube, muscle, liver and if the excess glucose is not utilized it will be converted as Low density Lipoprotein.

Conducted a study on 20 years trends in cardiovascular risk factors in India and influence of educational status. Adjusting for educational status masked linear trends in BMI, total and Low density Lipoprotein cholesterol while highlighting systolic blood pressure, glucose, and High density Lipoprotein cholesterol. Hence the study concluded that educating the patient reg diet and exercise will reduce the Low density Lipoprotein and there is high prevalence of cardiovascular risk factors also.

Discussion on High Density Lipoprotein- If the glycolytic process is well balanced between energy intake and output, the working muscle can consume more volume of glucose and it will be utilized by our working muscle. After Bypass grafting and planned exercise would be utilized blood glucose and finally there is less chance of forming excess cholesterol in the body. Once the bad cholesterol is not formed a higher level, automatically High Density Lipoprotein will be increased. If good cholesterol increases, it will act as a transporter to bring back unwanted cholesterol from muscle to liver. And then the liver is to convert excess cholesterol into two different energies like thermal and chemical. It is concluded that the 12 weeks of training period is a better increase of High Density Lipoprotein levels.

Conducted a clinical study in Coronary Artery Bypass grafting 395 men subjects. In this study there was improving their both High Density Lipoprotein and Low Density Lipoprotein level after the Coronary Artery Bypass grafting. In this study also there was lowering their High Density Lipoprotein levels, even in this study also done with men only.

Discussion on the triglyceride depending on the cause, it might be able to lower the high triglyceride levels in just a few days. After a night of drinking or eating sugary foods, your triglyceride levels could increase. By reducing intake of sugar and alcohol, your levels can recover to normal within a few days. It's imperative to exercise regularly if want to minimize the triglyceride levels. When you expend calories, the body uses more of its triglycerides. So these 12 weeks of Cardiac Rehabilitation exercise will be beneficial to reduce the Triglycerides. Investigated a study to find the effect of exercise after Coronary Artery Bypass Grafting with 88 subjects for 5 weeks of training. At the training they were measured the heart rate, Blood Pressure along with Triglycerides, High density Lipoprotein, Low density Lipoprotein, and Total cholesterol. The study results showed better improvement in the above variables along with the exercise training. In this study also the results showed better improvement in the experimental groups when compared with the control Group.

From these analyses, it is found that the results obtained from the experimental groups had significantly shown that they were improved their normal life before to the surgery and their lung and chest expansion was also improves in patent with CABG, this is due to all the patient has undergone their protocols in time and as well as fallow the roles and regulation. They were reduced levels of total cholesterol, low density lipoprotein and triglycerides level and increased the

high density liprotein, in the analyses on Experimental Groups. It is interesting to note that the results obtained the value of total cholesterol, high density liprotein, low density lipoprotein and triglycerides levels from Experimental Group II had greater decreased from its lower level to maximal level than Experimental Group I. It is interesting to note that the results obtained the value of high density lipoprotein levels from Experimental Group II had greater increased from its lower level to maximal level than Experimental Group I. This is due to the long term exercise protocol in the Experimental Groups II and I where as the Control group was randomly given exercise and which was not monitored also. It is concluded that the experimental groups had greater improvement in the CABG subjects, due to influence of cardiac rehabilitative protocols for a period of twelve week training.

Conclusion

It was concluded that the significantly decreased on biochemical variables such as Total Cholesterol Level, Low Density Lipoprotein, Triglyceride and increased High Density Lipoprotein due to the influence of the two different packages of cardio rehabilitative protocol among the Coronary Artery Bypass Grafting subjects than the control group.

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