

A Comparative Study to Evaluate the Effectiveness of Resisted Exercises Verses Antidepressant Medication in Young Adult Males Diagnosed with Major Depressive Disorder

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Abstract

This study aims to compare the effectiveness of a combination of 12 weeks resisted exercises programme and antidepressant medication with 12 weeks of antidepressant medication alone. 100 young adult males between the age range 18-39 years diagnosed with major depressive disorder using the ICD 10 criteria, were recruited for the study. 50 Subjects each were randomly assigned into either an experimental or a control group after baseline data was obtained, using the 17- item Hamilton depression rating scale (HDRS17). The experimental group underwent 12 weeks of resisted exercises along with their regular antidepressant medication and the control group had only antidepressant medication as intervention. Our objective was to investigate whether the mean change in (HDRS17) scores from baseline was greater after 12 weeks of resisted exercise when compared with antidepressant medication alone. This study concluded that combination of resisted exercise along with antidepressant medication is more effective than antidepressant medication alone in the treatment of major depressive disorders in young adult males.

Key words - major depressive disorder, resisted exercise, antidepressants, 17- item Hamilton depression rating scale

1) Introduction

A large amount of research has examined the effect of exercise on mood, a significant number of studies claim both aerobic and resisted exercises are better than no treatment or results are comparable with different modes of psychotherapy. A study which examined the efficacy of progressive resisted exercise as a potential therapeutic intervention in the treatment of depression among elderly subjects concluded that ,progressive resistance training is an effective antidepressant in elders, which also benefits in gaining muscle strength, morale and quality of life. (Nalin a. singh, karen m.clements, Maria a. fiatarone. 1997). The dose response characteristics of exercise studied by the same authors concluded that high intensity progressive resistance training is more effective than is low intensity progressive resistance training or general practitioners care for the treatment of older depressed patients (Nalin a.singh, theodora m.stavrinos, yvonne scarbek et al 2005). A comparison of running verses weight lifting among depressed woman results suggested that both running and weight lifting exercise programs improve self-concept in clinically depressed women. (Deborah J. Ossip-Klein, Elizabeth J. Doyne, Eric D. Bowman et al.)

In our previous randomized control trial we found out that a combination of aerobic exercise along with antidepressant medication is more effective than antidepressant medication alone in the treatment of major depressive disorders in young adult males. (Jobby George ,vv.mohan chandran, sandesh t.s ,2012). But the gap in knowledge regarding efficacy of resisted exercises in reducing symptoms of depression when compared with antidepressant medication among young adult males still persist, therefore we designed our study to test the hypothesis that, there will be significant difference in depression scores between the experimental and the control group at 12 weeks.

2) Objectives

1. To determine the effect of resisted exercises (experimental group) on depression scores at 4, 8 and 12 weeks
2. To determine the effect of antidepressant medication (Control group) on depression scores at 4, 8 and 12 weeks
3. To compare the effectiveness of resisted exercises vs. antidepressant medication at 12 weeks.

3) Methodology

This was a 12 week randomized control trial, Pretest post test control group design was used .Randomization was done following baseline data assessment, by lottery method as illustrated in table no.1.

Table no. 1: Schematic representation of research methodology

	Randomization	4weeks	8 weeks	12 weeks
		Experimental group resisted exercise + medication n= 50(HAMD17)	Experimental group resisted exercise + medication n= 50(HAMD17)	Experimental group, resisted exercise + medication n= 50(HAMD17)
Total sample size 100 baseline data assessment (HAMD17)	Control group Medication only n=50(HAMD17)	Control group Medication only n=50(HAMD17)	Control group Medication only n=50(HAMD17)	

Young adult males in the age range 18-39 with a depression score of at least 13 on the Hamilton depression rating scale at study entry, were recruited from selected outpatient psychiatric departments of various hospitals in Dakshina kannada .Diagnosis of major depressive disorder was according to ICD 10 criteria . Subjects who were able to comprehend and understand English or Kannada only were eligible. Subjects who had no history of exercise participation for the previous 1 year were recruited. Patients diagnosed with associated psychiatric illness other than depression, Cardiac diseases, bones and joints pathology, alcohol or substance abuse, acute infectious diseases, depressive patients with suicide risk were all excluded. All the 100 subjects in the study underwent a thorough medical checkup which included the cardiovascular, respiratory, and orthopedic examination by specialists in the respective field. Subjects in the experimental group received medication and resisted exercises for 12 weeks at a frequency of 3 sessions per week and intensity of 50%, 75% and 100% of 10 repetition maximum (RM) predetermined by Delomes technique . Duration of each session was 45 minutes which started with warm up, stretching of major muscles of the upper and the lower limbs which progressed to squatting, shoulder press dumbbell wrist curls and reverse wrist curls on the following exercise equipments respectively, Smith Machine WC02A strength gym,WC 39A Flat Shoulder Press and Olympic Curl Bar with adjustable weights ,WC healthy living. Following the exercise cool down and relaxation was implemented as mentioned in table no. 2 .All sessions were supervised by the principal investigator. Discussions about depression were minimized and all subjects in the group were advised to follow prescriptions of antidepressant medication by the psychiatrist. The control groups received antidepressant medications alone and were advised to follow prescription by the psychiatrist. Depression score were assessed at 4th, 8th and 12th week in both the groups. The primary outcome measure was the Hamilton depression rating scale (HAMD17) .Assessment of depression scores at baseline and at 4th, 8th and 12th week was done by a blinded assessor, a specialist in psychiatry.

Table no.2.Exercise protocol (Experimental group): 1) warm up, 2) conditioning phase 3) cool down, 4) relaxation

Delomes technique-10 RM

Warm up	Conditioning phase Continuous training				Cool down / relaxation
Walking 5mts	Intensity	Frequency	Mode	Duration 60second rest between sets	Passive recovery in sitting
Stretching major muscels groups 5 mts	50% of 10 RM	3 times per week	squatting	8 repetition × 2 sets	
	75% of 10 RM	3 times per week	Shoulder press	8 repetition × 2 sets	
	100% of 10 RM	3 times per week	Dumbbell wrist curls and reverse wrist curls	8 repetition × 2 sets	

4) Results

4.1) Table no: 3. illustrates the effect of resisted exercise on depression scores, mean and standard deviation

The mean depression scores on the Hamilton depression rating scale was $(17.28) \pm 2.7$ at baseline and gradual reduction in mean values $(15.76) \pm 2.3$ after 4 weeks $(14.32) \pm 2.2$ after 8 weeks, and $(12.74) \pm 1.7$ after 12 weeks of aerobic exercise in the experimental group . Whereas in the control group the mean depression scores at baseline were $(17.20) \pm 2.7$, $(16.34) \pm 2.7$ at 4 weeks, $(15.76) \pm 2.7$ at 8 weeks and $(15.10) \pm 2.7$ at 12 weeks following drug therapy only.

4.2) Table no: 4.shows F value, p value and two way ANOVA values of depression scores for repeated measure, its difference over period and difference between the experimental and control group.

By implementing two way ANOVA for repeated measures, its difference over a period and difference between the groups were estimated. In the experimental group, periodic evaluation at 4th, 8th and 12th weeks show decrement in depression scores as the weeks progressed, the F value is 338.390 and p value 0.000 at 0.05 level of significance, inferring that the reduction in depression scores over the weeks in the experimental group are highly significant which indicates that resisted exercise in combination with drug therapy is more effective than drug therapy alone in the treatment of major depressive disorder in young adult males. When comparing the difference of the depression scores between the experimental and the control group F value (4.815) and p value was .031 at 0.05 level of significance, which was significant indicating that the experimental group which underwent resisted exercise in combination with drug therapy is more effective than drug therapy alone in case of major depression.

4.3) Table no: 5 Describes the mean difference, p value for pair wise comparison which is performed by Bonferroni test followed by ANOVA significant over the period of time.

Following the significant results on testing by Anova, Bonferroni test was used for pair wise comparison of depression score over a period of time, baseline depression scores were compared with depression scores at 4th, 8th and 12th weeks, and a comparison of 4th week with 8th and 12th week, and 8th with 12th week, in both the group concluded that, reduction in Depression score were highly significant during all the comparisons, but higher reductions in depression scores were obtained in the experimental group than the control group over a period of time, indicating that resisted exercise along with drug therapy is more effective than drug therapy alone as the weeks progressed.

4.4)Table no: 6 enumerates the mean difference and p value for pair wise comparison which is performed by Bonferroni test followed by ANOVA significant between the experimental and control group

Following the significant results on testing by Anova, pair wise comparison of depression score between experimental and control groups was performed by Bonferroni test .Depression scores at baseline were compared with scores at 4th, 8th and 12th weeks, and the weekly depression scores recorded were compared to the next corresponding weeks ,indicated that depression score obtained highly significant level of reduction in both the group but experimental group showed higher reduction in depression scores when compared with the control group, thus indicating that resisted exercise along with drug therapy is more effective than drug therapy alone as the weeks progressed.

5) Discussion

In this study both the experimental and the control group showed reduction in mean value of depression scores from baseline and when compared at 4th, 8th and 12th weeks. The improvement in depression scores in experimental group over the period of weeks and over the control group was highly significant. The limitation of the study include the inclusion of only males for a short duration of 12 weeks ,for generalization of results of this study the same study can be implemented on a large population of various ethnicity. Similar study could be undertaken to compare the effectiveness of aerobic vs. resisted exercise in major depressive disorders.

6) Conclusion

Both the experimental and the control group showed highly significant reduction in depression scores from baseline as well as over the period of weeks. But the experimental group showed higher reduction in depression scores from baseline and over the weeks than the control group, thus concluding that resisted exercises in combination with drug therapy is more effective than drug therapy alone in the treatment of major depressive disorders in young adult males.

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Table no: 3) illustrates the effect of aerobic exercise on depression scores, mean and standard deviation

Group	Weeks	N	Minimum	Maximum	Mean	standard deviation	Median
Experimental	Baseline	50	13	22	17.28	2.718	17
	4 week	50	11	20	15.76	2.308	16
	8 weeks	50	10	20	14.32	2.236	14
	12 weeks	50	10	18	12.74	1.747	12.50
Control	Baseline	50	13	24	17.20	2.777	17
	4 week	50	12	23	16.34	2.789	16
	8 weeks	50	11	22	15.76	2.796	15
	12 weeks	50	11	21	15.10	2.735	15

Table no: 4) enumerates F value, p value and two way ANOVA values of depression scores for repeated measure, its difference over period and difference between the experimental and control group.

ANOVA values of depression scores for repeated measure	F value	Df	P value	Inference
Difference over a period	338.390	3, 294	0.000	HS
Difference between the experimental and control group	4.815	1, 98	.031	Sig

Table no: 5) describes the mean difference, p value for pair wise comparison which is performed by Bonferroni test followed by ANOVA significant over the period of time.

Group	Weeks	Mean difference	Standard error	p value	Inference	
Experimental	Baseline	4 weeks	1.520	0.162	0.00	HS
		8 weeks	2.960	0.202	0.00	HS
		12 weeks	4.540	0.270	0.00	HS
	4 weeks	8 weeks	1.440	0.134	0.00	HS
		12 weeks	3.020	0.201	0.00	HS
	8 weeks	12 weeks	1.580	0.172	0.00	HS
Control	Baseline	4 weeks	0.860	0.086	0.00	HS
		8 weeks	1.440	0.118	0.00	HS
		12 weeks	2.100	0.112	0.00	HS
	4 weeks	8 weeks	0.580	0.081	0.00	HS
		12 weeks	1.240	0.093	0.00	HS
	8 weeks	12 weeks	0.660	0.089	0.00	HS

Table no: 6 describes the mean difference and p value for pair wise comparison which is performed by Bonferroni test followed by ANOVA significant between the experimental and control group.

Groups	Weeks	Mean difference	Standard error	p value	Inference
Between Experimental and control group	Baseline to 4 weeks	-0.660	0.184	0.01	HS
Between Experimental and control group	Baseline to 8 weeks	-1.520	0.234	0.00	HS
Between Experimental and control group	Baseline to 12 weeks	-2.440	0.294	0.00	HS
Between Experimental and control group	4 th to 8 th week	-0.860	0.157	0.00	HS
Between Experimental and control group	4 th to 12 th week	-1.780	0.221	0.00	HS
Between Experimental and control group	8 th to 12 th week	-0.920	0.193	0.00	HS

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