Original Resear	Volume -10 Issue - 5 May - 2020 PRINT ISSN No. 2249 - 555X DOI : 10.36106/ijar Physiotherapy EFFECTIVENESS OF LOW IMPACT AEROBIC TRAINING VERSUS STRENGTH TRAINING ON IMPROVING AEROBIC CAPACITY IN HYPOTHYROID PATIENTS
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ABSTRACT Background: Hypothyroidism does not only bring hormonal imbalances in the patients but also physical changes which in turn affect the functional outcome of the patients. **Purpose:** To evaluate the effectiveness of low impact aerobic training versus strength training on improving aerobic capacity in patients with Hypothyroidism. **Methodology:** Study Design-Experimental, Samples of 30 subjects with hypothyroidism (n=30) from six months or more were included in this study. Subjects were conveniently divided into two groups with 15 subjects in each group. Group A was given Low impact aerobic training and Group B was given Strength training for 3 days in a week for three weeks. The duration of this study was of 6 months. The outcome measures used were 6 Minute Walk Test and Borg scale through which the subjects were assessed pre and post intervention period. **Statistical analysis & Results:** The mean difference in Group A was 3.9867 and Group B was 2.3800 according to 6 MWT. And the mean according to Borg scale in Group A was 2.565 and Group B was 2.739. This shows there is statistical difference in 6 MWT and Borg scale scores between Group A and Group B. **Conclusion:** According to our study both the interventions Low impact aerobic training showed improvements in aerobic capacity of the subjects but low impact aerobic training in comparison to strength training brought a significant changes in aerobic capacity in Group A participants.

KEYWORDS: Low impact aerobic training, Rate of perceived exertion, strength training, hypothyroidism

INTRODUCTION

Hypothyroidism means that the thyroid gland can't make enough thyroid hormone to keep the body running normally.¹

In India, hypothyroidism was usually categorized under the cluster of iodine deficient disorders (IDDs), which were represented in terms of total goitre rates and urinary iodine concentrations, typically assessed in school-aged children. The prevalence of hypothyroidism in India was high, affecting approximately one in 10 adults in the study population. Female gender and older age were found to have significant association with hypothyroidism. Hypothyroidism was found to be a common form of thyroid dysfunction affecting 10.9% of the study population. The prevalence of undetected hypothyroidism was 3.47% i.e., almost one-third of the hypothyroid patients (186 out of 587) were diagnosed for the first time during the course of study-related screening.²

More severe symptoms associated with hypothyroidism may include:Slow than normal (for the patient) heart rate, reduced aerobic capacity, decreased muscle performance, High blood pressure and High cholesterol.³

Physical therapy programs like low to moderate intensity aerobic training, Pilates, walking, jogging, endurance training and strength training have proved to be effective in reducing these symptoms in such patients.^{4,3,6}

METHODOLOGY

This experimental study is to evaluate the effectiveness of low impact aerobic training versus strength training on improving aerobic capacity in hypothyroid patientsThis study was conducted in Parul University, Limda, Vadodara. The subject who met the inclusion criteria was included in the study. The 30 subjects were included and divided into two groups group A(n=15) and group B(n=15) by using chit method. An informed written consent was taken. The study was approved and conducted between 2018 and 2019 in accordance to the guidelines of the local ethics committee of the Parul Institute of Physiotherapy. The study is carried out for the duration of 6 months the protocol for both the group is for 3 days per week for 3 weeks. Evaluation is taken before start of the training and atthe end of the training with the use of 6 Minute Walk Test.

Inclusion Criteria: Both genders will be included in the study, Subject who is able to understand and follow simple verbal instruction, Age between 35-50 years and subjects who willingly participate or who signed inform consent. The subjects having Hypothyroidism >6 months and are on an adjacent drug therapy or taking <75mg of

thyroxin tablets.

Exclusion Criteria: People having Hypothyroidism <6 months, who have any othermusculoskeletal and/or neurological disorder, who have Hypothyroidism >6 months but are not taking any drug therapy. Subjects with moderate to severe cardiovascular problem, psychologically ill and pregnant ladies

PROCEDURE: Samples of 30 outdoor hypothyroidpatients was taken. Subjects were divided into two groups 15 in each group by chit method. Group A: low impact aerobic training and Group B: Strength training. A clear demonstration of exercises was given to the subjects of both the groups before commencing the protocol.

GROUP-A(LOWIMPACTAEROBIC TRAINING)⁷

Low impact aerobic training consists of aerobic exercises for 30 minute session. It basically has exercises focusing on cardio vascular endurance as well as aerobic capacity of a person. The exercises which are included are of low impact that can be performed by people who haven't been physically active and are accustomed to ADL.

6-MWT was performed by all the patients' pre and post the treatment protocol was given. It was taken at the day of starting the treatment and at the end of three weeks. Also precaution was taken during the test and treatment period. The session started with general 15 minute warm up which consisted of active range of motion of all joints, stretching of major muscle groups like triceps, lattisimus dorsi, gluteus, quadriceps, hamstrings and calf. All the exercises were given in 2 sets with 10 repetitions each and 2 minute rest between each set. This was followed by a cool down period of 15 minutes which included stretching of major muscle groups and relaxation which included Deep breathing exercise.

The Aerobic exercise program consisted of following exercises:Jumping jacks, Windmill steps, Stutter steps, Finger to toe jacks, Static squat and punch,

GROUPB-(STRENGTH TRAINING)^{8,9}

In Strength training the subject performed 7 strengthening exercises which targeted the major postural muscles like glutes, quadriceps femoris, hamstrings, biceps, triceps, pectorals, back extensors and abdominals. All the exercises were given in 2 sets with 10 repetitions each and 2 minute rest between each set and plank hold was done for 30 seconds each and progressively the time was increased. The subject received same warm-up and cool down as that of GROUP A. Also the subjects were given to fill up a 6-MWT form pre and post the intervention as in GROUP A. The Strength exercise program consisted

of following exercises. Squatting with swiss ball, Wall push-ups, Back extension over swiss ball, Bridging on ball, Static adductors, Abdominal curls, Plank.

STATISTICALANALYSIS

Statistical tests:

Paired't' test as a parametric had been used for analysis of 6 Minute Walk Test within the Group A and Group B with calculation of percentage of change.

Independent't' test as a parametric had been used the compare the means of 6 Minute Walk Test between the groups with calculation of percentage of difference between the means.

Statistical software:

The Statistical software namely SPSS 20 was used for the analysis of the data and Microsoft word and Excel had been used to generate graphs tables etc.

Graph: 1 Distribution by Gender in Group A and Group B.



Graph: 2 Distribution by Age in Group A and Group B



The above graph shows a large group of subjects lie in the age group 35-40.

Table:3 Comparison of two time periods pre time and post time of treatment with respect to 6 MWT in both the groups.

Groups	Time	Mean	Standard	Mean	SD	% of	P-
			deviation	Diff.	Diff.	change	Value
			(SD)				
GROUP	Pre test	118.47	22.1669	-3.9867	2.8475	14	.000
A		3					
	Post	122.46	22.5487				
	test	0					
GROUP	Pre test	117.58	8.5565	-12.380	10.162	14	.000
В		0		0	2		
	Post	129.96	15.8058				
	test	0					

*p<0.00

Graph: 3 Comparison of mean difference according to 6 MWT between Group A and Group B



RESULTS

There is significant difference in pre and post intervention score in both 6 MWT and Borg scale within Group A with p<0.005. While in Group B which consists of 15 patients the mean according to 6 MWT was 117.5 and post treatment mean was 129.9 and according to Borg scale the pre treatment mean was 2.4 and post treatment mean was 1.9 which shows there is significant difference in pre and post intervention score

in both 6 MWT and Borg scale within Group B with p<0.005. The mean difference in Group A was 3.9867 and Group B was 12.3800 according to 6 MWT. And the mean according to Borg scale in Group A was 2.565 and Group B was 2.739. This shows there is statistical difference in 6 MWT and Borg scale scores between Group A and Group B.

DISCUSSION

The results of this study extend supporting the efficacy of physical activity regimens focusing on endurance and strengthening exercises in enhancing both measured and self-rated physical performance and functioning. As the goal of the study was to test the efficacy of the interventions at the functional improvements titled "Effectiveness of Low impact aerobic training versusStrength training on improving aerobic capacity in Hypothyroid Patients"

The outcome measures used were 6 MWT which is a sub-maximal exercise test used to assess aerobic capacity. The distance covered over a time of 6 minutes is used as the outcome by which to compare changes in performance capacity. It evaluates the functional capacity of the individual and it provides valuable information regarding all the systems during physical activity, including pulmonary and cardiovascular systems. The mean difference in Group A was 3.9867 and Group B was 12.3800 according to 6 MWT. And the mean according to Borg scale in Group A was 2.565 and Group B was 2.739. This shows there is statistical difference in 6 MWT and Borg scale scores between Group A and Group B.

CONCLUSION

The Low impact aerobic training is more effective and beneficial therapy protocol for improving aerobic capacity in hypothyroid patients and can be used in combination with other therapy protocols.

LIMITATIONS OF THE STUDY

- Limited sample size 1
- 2. Age limitations.
- 3 It was difficult to find similar sizes of ball during consecutive sessions.

FURTHER RECOMMENDATIONS

- The combination of Low Impact Aerobic training and Strength 1. training can give better results.
- 2. The treatment period could be extended for 6 months or a year for better and long lasting results.

Ethical clearance: Taken from Ethical Parul institute of physiotherapy committee. Parul University, Vadodara, Gujarat, India.

Conflict of Interest: Nil Source of funding: Self

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