

## Aerobic Exercises on Type II Diabetic with Hypertension

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**Structured, Scientific means of Aerobic Exercises results in an improved Aerobic Power in Cardio respiratory system, within Muscle and Obesity, Blood pressure an improved glycaemic control. This study where the effects of Aerobic Exercises among Type II diabetes with Hypertension are analysed for their effects on obesity, hba1c and Blood Pressure. Methods: Being an Experimental Study Subjects, with known Type II DM and HT on Medication at random are allotted in two Groups. Duration of the study was six months from 2008 to 2013. The study was conducted at Sree Balaji College of Physiotherapy, Chennai – 100. All the subjects waist circumferences, HBA1C, Blood Pressure, and Heart rate were measure once at the beginning and after at the completion of the study. Results: This Study reveals mean heart Rate reduced by 2 /mt, HBA1C by .34%, waist circumference by 2 cm and a mean reduction of systolic Blood Pressure by 3mm, diastolic by 2mm/ng, among Aerobic subjects, while control subjects have shown insignificant outcome. Aerobic Exercises done regularly are effective on improving Glycaemic control, HTN and Obesity.**

**Key words:** HTN -Hypertension, ACSM – American College of Sports Medicine, WHO -World Health Organization, HBA1C -Glycelated Haemoglobin.

Diabetes related healthcare cost Accounted for 11% of The Global healthcare Expenditure in adults in 2013 (Leahy2015). Hypertension is a major contributor to the cardiovascular morbidity and mortality in Industrialised Countries (Yusuf etal 2001). Among Urban Indian Population between 25-65 Years 22% have HTN 41% to be diabetic and 26% are Smokers. (Purse - Hip 2011). Central Obesity Is Associated with Hypertension (Resin 1990) And Type II Diabetes (Ramachandran 2003).Obesity, Diabetes and Smoking Are Risk Factors for HTN in Most Countries (Sing 2000). WHO report in 2005 reports that India Lost 9 Billion US Dollar in 2015 due to premature death from Stroke, DM and heart Disease. Weight Loss due to a fat reduced diet, life style modifications and exercises results in a

sustained reduction in blood pressure (Wood 1991). With Aerobic Exercises (2004 Mayo Clinic) a reduction in blood pressure were recorded. Physical activities using Physioball is effective in improving glycaemic control among Type II Diabetics (Subramanian 2014).

### **Background of this study**

This original research study aims to analyse the efficacy of Aerobic Exercises among Type II diabetic Indian Patients with Hypertension which is the first of its Kind, Shall strive to provide a Non Pharmacological intervention and cost effective management in the overall management of clinical trio of obesity, HTN and DM.

### **Inclusion Criteria**

Type II Diabetic Patients with HT of both Sex.

### **Exclusion Criteria**

Subjects with Cardiac, Nephro Neuro Complications.

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**Materials and Methodology**

Ethical clearance was obtained. This study was conducted between 2008-2013. Diabetic camps were conducted in May 2010. 120 subjects with known Type II diabetic were recruited in this study. Consent forms were obtained from all the participants. Using an experimental design all the subjects were allotted at random in two groups. Participants continued their duly prescribed Medication by their physician and daily routines.

Group I- No Specific Activities Were Prescribed (Control Group).

Group II- performed Aerobic Activities (Experimental Group).

Mercury sphygmomanometer was used in supine position to measure Blood Pressure. Best of two readings were taken at a 8 hours fasting state, two readings were taken at a fasting level, once prior to study, and after 6 months completion of study waist circumference at Xi phoid process was measured using an inch tape and recorded and a fasting HBA1c was measured twice once at the beginning, followed by resting heart rate was measured twice. Once prior to study and upon completion of the study.

Baseline Information of All the Subjects:

Waist Circumference → 97 cm

Mean Age → 47 Years

Smoking Habit → 30 % Known History of

Coronary Artery Disease → 47%

**Procedure**

Group II Subjects Have Performed Stretching Of Muscles Such As

General Warm up, Pre Stretching, Aerobic

warm up, Aerobic Activities and Cool Down.

Progression is made based on ACSM Guidelines.

**RESULTS AND DISCUSSION**

Among Aerobic subjects decrease in mean Heart Rate by 2/ minute, is similar to a study conducted by Salama Bweir et al 2009. Lowering of Heart rate with physical exercises implies an improved cardiac efficiency (Will more et al 1988).

Lowering of Blood Pressure among Aerobic subjects with a decrease of mean systolic by 3 mm/hg and mean diastolic by 2 mm/hg. These findings are similar by another study conducted by Yun Kee et al 2010.

Economy of the muscle metabolism improves with Aerobic Training (Lewis et al 1985) also an improved health benefits and an improved endothelial function are reported with Aerobic Exercises (Green et al 2008).

Among Aerobic Subjects a reduction in mean HBA1C by .34% is similar to findings of a study conducted by Ronald et al 2007. An improved glycaemic control with Aerobic Exercises are associated with decreased risk for Myocardial ischemic, stroke, peripheral Vascular disease (UKPD 1995) and a reduction of HBA1C is associated with improved regulation of GLUT4 (Banks et al 1992).

A Mean reduction in waist circumference among Aerobic Subjects by 2 cms is similar to findings by Boule et al 2001 and hence these subjects benefit from Obesity related Cardio

**Table 1.** Mean Waist Circumference and paired 'T' Test of Group I and II

Group	Pre Meancm	Post Mean cm	SD	SE	P
Group I	97	97	.89	.14	P>.1.
Group II	98	96	2.81	.40	P<.05..

. Non Significant

.. Significant

**Table 2.** Mean HBA<sub>1</sub>C and Paired 'T' Test of Group I and II

Group	Pre Meancm	Post Mean cm	SD	SE	P
Group I	7.72	8	.28	.04	P>.1.
Group II	7.74	7.48	.66	.09	P<.05..

. Non Significant

.. Significant

**Table 3.** Mean and Paired 'T' Test of Heart Rate of Group I and II

	Pre Mean Pre Minute	Post Mean Per Minute	SD	SE	P
Group I	84	85	.4	.004	>.1.
Group II	90	88	4.57	.65	P<.05..

. Non Significant .. Significant

	Mean	mm/ng	SD	SE	P
<b>Systolic B.P</b>					
Group I	Pre	122.56	1.94	.24	P>.1.
	Post	12.5			
Group II	Pre	122	5.09	.72	P<.05..
	Post	119			
<b>Diastolic B.P</b>					
Group I	Pre	82	1.67	.24	P>.1.
	Post	83			
Group II	Pre	81	5.74	.81	P<.05..
	Post	79			

. Non Significant

.. Significant

Vascular complications among Type II DM are prudent conversion of Type II b fibres to Type II a, are major physiological mechanism with Aerobic Exercises (Saltin et al 1980).

### CONCLUSION

Findings of this original research study with lowering of blood pressure, hba1c, obesity can be extended for prediabetic patients, children for further studies. Also detraining effects and larger sample size, comparing other modes of physical activities are recommended.

As shown in the findings of this research instead of just walking, concept of structured Aerobic components be spread among diabetic and hypertensive subjects for an improved benefits also a scientific mean of doing walking is facilitated.

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