



## EFFECTIVENESS OF ALLEN BUERGER EXERCISE IN PREVENTING PERIPHERAL ARTERIAL DISEASE AMONG PEOPLE WITH TYPE II DIABETES MELLITUS

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### ABSTRACT

Diabetes mellitus increases the risk of lower extremity peripheral arterial disease by 2 to 4 times and is present in 12% to 20% of persons with lower extremity peripheral arterial disease. The risk of developing lower extremity peripheral arterial disease is proportional to the severity and duration of diabetes and 7- to 15-fold more likely to undergo a major amputation is also greater in diabetics than non diabetics. To determine the effectiveness of Allen Buerger Exercises among people with Type II Diabetes Mellitus by using Ankle –Brachial Index. Experimental Research Design with 30 samples in experimental group and 30 samples in control group were selected by using random sampling technique at Kuthambakkam village. Peripheral arterial disease and the effectiveness of Allen Buerger exercise was assessed by Ankle Brachial index Scale. The findings of the study revealed that there is a significant improvement in Ankle-Brachial index Score in preventing peripheral arterial disease among people with Diabetes Mellitus in experimental group after receiving Allen Buerger exercise at the level of  $P < 0.05$  and there is a significant association between the duration of diabetes mellitus and the pretest score of ABI. Study participants got benefited by Allen Buerger exercise in preventing Peripheral Arterial Disease.

**KEYWORDS:** Allen Buerger exercise, Diabetes Mellitus, Peripheral Arterial Disease, Type II Diabetes Mellitus.



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## INTRODUCTION

Diabetes mellitus increases the risk of lower extremity peripheral arterial disease by 2 to 4 times and is present in 12% to 20% of persons with lower extremity peripheral arterial disease. In the Framingham Heart Study, diabetes increased the risk of intermittent claudication by 3.5 and 8.6 times in men and women; respectively. The risk of developing lower extremity peripheral arterial disease is proportional to the severity and duration of diabetes and 7- to 15-fold more likely to undergo a major amputation is also greater in diabetics than non diabetics Intermittent claudication is the most common symptom in patients with lower extremity peripheral arterial disease. The majority of individuals with lower extremity peripheral arterial disease does not experience recognizable limb ischemic symptoms. Individuals with classic asymptomatic lower extremity peripheral arterial disease have measurable limb dysfunction and adverse cardiovascular outcomes. Lower extremity peripheral arterial disease was considered present when the ABI was less than 0.90 in either leg. The prevalence of lower extremity peripheral arterial disease was 19.1% .16.9% in men and 20.5% in women. Symptoms of intermittent claudication were reported by 1.6% (95% CI 1.3% to 1.9%) of the study population (2.2% in men, 1.2% in women). Of those with lower extremity peripheral arterial disease, 6.3% reported symptoms of intermittent claudication (8.7% in men, 4.9% in women). ABI measurement can be useful to diagnose lower extremity peripheral arterial disease in individuals who are at risk for lower extremity peripheral arterial disease who have a normal ABI (0.91 to 1.30), are without classic claudication symptoms, and have no other clinical evidence of atherosclerosis. McDermott et al. evaluated the ABI and measures of upper and lower extremity functioning in 933 patient with Diabetes Mellitus in the Health and Aging Study (123). Within this cohort, 328 subjects (35%) had lower extremity peripheral arterial disease as defined by an ABI less than 0.90. The current NIH-funded study follows a pilot study that tested the benefits of

“Allen Buerger” and the results have shown signs of hope for patients with PAD. During this study, each member participated in either supervised for an hour three times per week for a total of 12 weeks. Each participant’s walking ability was tested before and after weeks of supervised exercise training and also after 12 weeks of follow-up to see if there was any improvement. After 12 weeks of exercise training, all exercise groups improved their walking ability, with 69 percent improvement in the exercise group Richards-George P.(2007) in his paper about vasculopathy on Jamaican diabetic clinic attendees showed that Doppler measurements of ankle/brachial pressure index (A/BI) revealed that 23% of the diabetics had peripheral arterial disease (PAD) which was mostly asymptomatic. This underscores the need for regular Doppler A/BI testing in order to improve the recognition, and treatment of PAD

## OBJECTIVES

- To assess the Pre test level of Ankle – Brachial Index Score of PAD among people with Type II Diabetes Mellitus.
- To determine the effectiveness of Allen Buerger Exercises among people with Type II Diabetes Mellitus.
- To associate the selected demographical variables with the post test level of Ankle-Brachial index score of PAD in experimental group.

## HYPOTHESIS

There is a significant improvement in Ankle-Brachial index Score of PAD among people with Diabetes Mellitus in experimental group after receiving Allen Buerger exercise.

## METHODOLOGY

### Research Design

Quantitative approach – Experimental Research design

### Variables

**Independent variable:** Allen Buerger Exercises

**Dependent variable:** PAD of people with Type II Diabetes Mellitus

### **Setting of the study**

The study was conducted at Kuthambakkam Village, Thiruvallur District. The total population of the village is 5000.

### **Population**

The target population of the study was all the people with Type II Diabetes Mellitus

### **Sample**

People with Type II Diabetes Mellitus for more than 4 years with ABI score is between 0.90 – 0.40 and who were on regular treatment and met the inclusion criteria was selected as a sample for the study.

### **Sample size**

The sample size was 30 in experimental group and 30 in control group

### **Sampling technique**

Sample was selected by using random sampling technique

### **Criteria for selection of samples**

#### **Inclusion criteria**

- ❖ People who were medically diagnosed as Type II Diabetes Mellitus and with regular treatment.
- ❖ People with Type II Diabetes Mellitus and had ABI score was less than 0.90 – 0.40
- ❖ Both male and female people
- ❖ People with the age group of 45 years – 60 years
- ❖ People who could speak Tamil or English.
- ❖ People who were available at the period of data collection.

#### **Exclusion criteria**

- ❖ People who were not willing to participate in the study
- ❖ people who had severe foot ulcer
- ❖ People with acutely ill
- ❖ Person who had the ABI score is less than 0.40

### **Description of the tool**

The Tool consist of two parts

Part-1: Demographic data.

Part-2: Ankle Brachial Index Scale

Part 3: Allen Buerger Exercise

### **Part 1- Demographic data**

The demographic data of patients which consist of age, sex, education, occupation, income, dietary pattern, duration of illness, habits and history of diabetes and hypertension .

### **Part-2: Ankle Brachial index Scale**

The ABI is calculated by dividing the systolic blood pressure at the ankle (Posterior tibial or Dorsalis Pedis) by the systolic blood pressures in the arm (Brachial) by using sphygmomanometer

### **Score Interpretation**

Above 0.9 - Normal

0.71 – 0.90 – Mild Obstruction

0.41 – 0.70 – Moderate Obstruction

0.0 – 0.40 – Severe Obstruction

### **DATA COLLECTION PROCEDURE**

The permission was obtained from Institutional ethical committee, Saveetha University, Chennai. Prior to data collection informed consent was obtained from the subjects after explaining the purpose of the study. ABI scale was used to assess pre test scores among experimental and control group. Allen Buerger's exercise was administered on same day among experimental group for 6 weeks. The duration of exercise was 15 minutes twice a day. Routine care and exercise was observed among control group. Post test was conducted after 6 weeks with same scale for both the group

### **DATA ANALYSIS AND STATISTICAL METHOD**

#### **Descriptive Statistics**

Mean and Standard Deviation.

#### **Inferential Statistics**

##### **Paired t test**

To determine the effectiveness of Allen Buerger Exercises among people with Type II Diabetes Mellitus in the experimental group.

**Independent t test**

To compare the effectiveness of Allen Buerger Exercises among people with Type II Diabetes Mellitus between the experimental group and control group

**Chi-Square test**

To associate the demographic variables with the post test score of ABI in both experimental and control group.

**RESULTS**

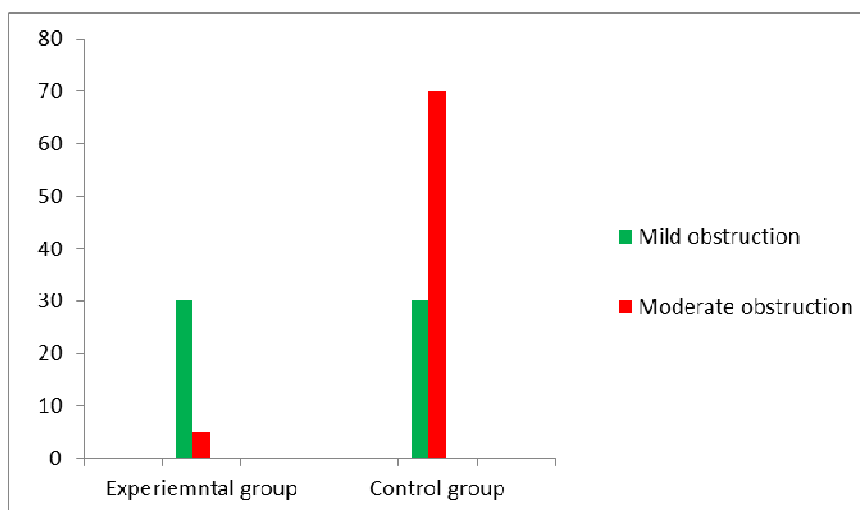
The findings of the study reported that the level of obstruction in the experimental group and control group as follows:

Level of obstruction	Experimental group		Control group	
	No	%	No	%
Mild	13	43	14	46
Moderate	17	57	16	54

Paired t test revealed that there is a significant improvement in Ankle-Brachial index Score in preventing peripheral arterial disease among people with Diabetes Mellitus in experimental group after receiving Allen Buerger exercise at the level of  $P < 0.05$ . Independent t test revealed that there is a significant difference between the experimental group and control group in preventing peripheral arterial disease among people with Diabetes Mellitus at the level of  $P < 0.05$ . Chi square test revealed that there is association between duration of diabetes mellitus and the pretest ABI Score at  $P < 0.05$  level.

**CONCLUSION**

The study concluded that the study participants got benefited by Allen Buerger exercise in preventing Peripheral Arterial Disease. Nurses play a significant role in preventing Peripheral Arterial Disease there by reducing the risk of amputation and restore normal function of the extremity by encouraging them to do the exercise which will help to improve the quality of life. Comparison of level of obstruction of peripheral arterial diseases among people with Type II Diabetes Mellitus in experimental group and control group



**CONFLICT OF INTEREST**

There was no conflict of interest found.

## REFERENCES

1. Brunner and Suddharth, Medical and Surgical Nursing” Lippincott publication Ltd, Philadelphia, 13<sup>th</sup> edition, 2012.
2. Vascular Risk Assessment of the Older Cardiovascular Patient: The Ankle-Brachial Index (ABI), November SP4, 2010
3. Kreines K, Johnson E, Albrink M, Knatterud GL, Levin ME, Lewitan A, Newberry W, Rose FA: The course of peripheral vascular disease in non-insulin-dependent diabetes. *Diabetes Care* 8:235-43, 1985
4. Kerry.J.Stewart, Ed.D, William.R.Hiatt, Exercise training for claudication, *The new England journal of medicine* , vol:347:1941-1951, 2002  
<http://content.nejm.org/cgi/content/short>
5. Adam J, Ogola G, Stafford, High intensity interval training for intermittent claudication in a vascular rehabilitation programme . Available from URL <http://www.ncbi.nlm.nih.gov/PMC>