

ORIGINAL RESEARCH ARTICLE

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## EFFECTIVENESS OF BUERGER ALLEN EXERCISE ON LEVEL OF LOWER EXTREMITY PERFUSION AMONG PATIENT WITH TYPE2 DIABETES MELLITUS.SAVEETHA MEDICAL COLLEGE AND HOSPITAL

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### ABSTRACT

**Aim of the study:** is to determine the effectiveness of Buerger-Allen exercise on level of lower extremity perfusion among type 2 diabetes mellitus patients in experimental group.

**Background:** During clinical posting in the Saveetha Medical College Hospital Chennai, the investigator came across many patient with type II diabetes mellitus who is suffered from a peripheral artery disease due to inadequate lower extremity perfusion and in helpless situation due to lack of knowledge regarding management of peripheral artery disease. By this experience, the investigator felt that nurses has an important role in educating the patients regarding supervised exercise like Buerger's Allen Exercise.

**Design:** Quasi Experimental pre – test and post – test design.

**Methods:** Non probability convenient sampling technique was used. A total of 60 admitted patients participated in the study. ABPI Scale was used to assess the level of lower extremity perfusion for data collection.

**Result:** There is a significant improvement in the level of lower limb perfusion in experimental group after Buerger Allen exercise than the control group among patient with type 2 diabetes mellitus at ( $p < 0.001$ ).

**Conclusions:** This study indicates that Buerger Allen Exercise is a simple non pharmacological and effective method for the management of lower limb perfusion among the patient with type 2 diabetes mellitus.

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### INTRODUCTION

Health is a dynamic condition resulting from a body's constant adjustment and adaptation in response to stresses and changes in the environment for maintaining an inner equilibrium. Wellness is first and foremost choice to assume responsibility for the quality of life. It begins with a conscious decision to shape a healthy lifestyle.

Diabetes mellitus is a group of metabolic diseases in which a person has high blood sugar, either because the pancreas does not produce enough insulin, or because cells do not respond to the insulin that is produced. This high blood sugar produces the classical symptoms of polyuria, polydipsia, and polyphagia. The incidence rates of diabetes have increased markedly over the last 50 years in parallel with obesity, as of

2010 there are approximately 285 million people with the disease compared to around 30 million in 1985. This is partly due to a number of complications with which it is associated, including two to four times the risk of cardiovascular disease, including ischemic heart disease and stroke, a 20-fold increase in lower limb amputations, and increased rates of hospitalizations.

## Background

According to the World Health Organization (WHO) report, India today heads the world with over 32 million diabetic patients and this number is projected to increase to 79.4 million by the year 2030. Recent surveys indicate that diabetes affects a staggering 10-16% of urban population and (5-8%) of rural population in India now. [4] There is very little data on the level of awareness and prevalence about diabetes in developing countries like India. It is estimated that there are currently 285 million people with diabetes worldwide and this number is set to increase to 438 million by the year 2030.

improve the blood circulation of the lower extremity exercise has been considered as one of the most effective non pharmacological management among patient with type 2 diabetes mellitus. Buerger Allen exercise is one of the most common practice exercise in diabetic patient to drain engorged vessel by using postural changes and stimulated peripheral circulation by modulating gravity and applying muscle contraction for improving the lower extremity perfusion among diabetic patients which relieve the symptoms in patients with lower limbs arterial insufficient. Therefore in order to promote the quality of life buergerallen exercise is needed among patient with type II diabetes mellitus.

**Aim of the study:** was to determine the effectiveness of Buerger-Allen exercise on level of lower extremity perfusion among type 2 diabetes mellitus patients in experimental group.

## MATERIALS AND METHODS

Total 60 patients with type 2 diabetes mellitus whose having ABPI score mild and moderate were selected by using non probability convenience sampling technique and the first 30

**Table 1: Frequency and percentage distribution of demographic variables among type 2 diabetes mellitus patients**

Demographic Variables	N = 60 (30+30)			
	Experimental Group		Control Group	
	No.	%	No.	%
Age				
30 - 35 years	0	0.00	0	0.00
36 - 40 years	0	0.00	6	20.00
41 - 45 years	4	13.33	7	23.33
46 - 50 years	8	26.67	17	56.67
Above50 years	18	60.00	0	0.00
Gender				
Male	20	66.67	21	70.00
Female	10	33.33	9	30.00
Marital status				
Married	30	100.0	30	100.0
Unmarried	0	0.00	0	0.00
Dietary pattern				
Vegetarian	7	23.33	2	6.67
Non-vegetarian	23	76.67	28	93.33
Duration of type2 diabetes mellitus				
5 - 10 years	9	30.00	18	60.00
11 - 15 years	16	53.33	12	40.00
16 - 20 years	5	16.67	0	0.00
21 - 25 years	0	0.00	0	0.00
Any regular treatment				
Intramuscular injection	0	0.00	0	0.00
Intravascular injection	0	0.00	0	0.00
Subcutaneous injection	30	100.0	30	100.0
Oral medication	0	0.00	0	0.00

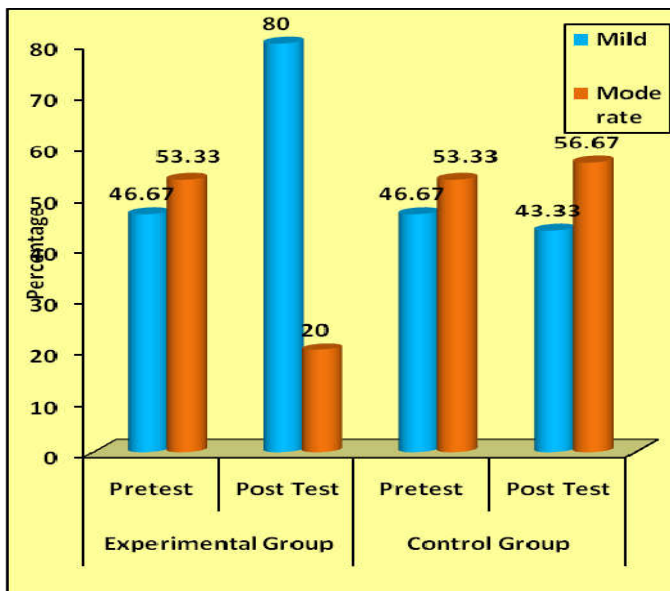
**Table 2: Comparison of pretest and post test level of lower extremity perfusion within and between experimental and control groups**

Group	N = 60 (30+30)				Paired 't' value
	Pre Test		Post Test		
	Mean	SD	Mean	SD	
Experimental group	0.68	0.14	0.84	0.11	t=13.656 p=0.0001 s***
Control group	0.68	0.12	0.68	0.13	t=1.722 p=0.096
Unpaired 't' Value	T=0.030 P=0.977, N.S		t=5.114 p=0.0001, S***		

\*\*\*p<0.001, S – Significant, N.S – Not Significant

The management of inadequate tissue perfusion in the lower extremity is similar to the management of peripheral artery disease since the decrease perfusion of the lower extremity cause peripheral artery disease. In the medical set up the treatment modalities focus on anti-platelet, anti-coagulations, antibiotic and revascularization procedure such as angioplasty, vascular bypass grafting, atherectomy and thrombectomy. To

patients were selected from male wards (I) and female wards (I) were placed them in experimental group and the next 30 patient with type 2 diabetes mellitus who met the inclusion criteria were selected from the female wards (II) and the male wards (II) were placed them in control group. After selecting the sample informed, the consent was obtained by using structured questionnaire and the demographic was collected.



**Figure 1. Percentage distribution of pretest and post test level of lower extremity perfusion among type 2 diabetes mellitus patients**

After collecting consent Buerger Allen Exercise was administered to experimental groups by investigator to each sample for 12-13 minutes. Repetitive intervention was given to the subjects for 12-13 minutes twice a day for duration of 5 (five days). The control group were treated with the routine hospital treatment. The investigator assessed the level of lower extremity perfusion by using ABPI in both experimental group and control group after 5 days ei, on 6<sup>th</sup> day of Buerger Allen Exercise repetitive trial. The data was analysed by using descriptive and inferential statistics.

**Ethical consideration:** The project has been approved by the ethics committee of the institution. Informed consent was obtained from the participants before initiating the study.

## RESULTS

The table 1 shows that in the experimental Group, majority 18(60%) were in the age group of above 50 years, 20(66.67%) were male, almost all 30(100%) were married, 23(76.67%) were non-vegetarian, 16(53.33%) had type 2 diabetes mellitus for 11 – 15 years and almost all 30(100%) were taking subcutaneous insulin injection as regular treatment. Whereas in the control group, majority 17(56.67%) were in the age group of 45 – 50 years, 21(70%) were male, almost all 30(100%) were married, 28(93.33%) were non-vegetarian, 18(60%) had type 2 diabetes mellitus for 5 – 10 years and almost all 30(100%) were taking subcutaneous insulin injection as regular treatment.

Above figure depicts that in the experimental group, majority 16(53.33%) had moderate PAD and 14(46.66%) had mild PAD whereas after the administration of Buerger Allen exercise on level of lower extremity perfusion majority 24(80%) had mild PAD and 6(20%) had moderate PAD among type 2 diabetes mellitus patients in the experimental group. The table 2 shows that in the experimental group the mean score of lower extremity perfusion was  $0.68 \pm 0.14$  and the post test mean score was  $0.84 \pm 0.11$ . Whereas in the control group, the mean score of lower extremity perfusion was  $0.68 \pm 0.12$  and the post test mean score was  $0.68 \pm 0.13$ . The calculated paired 't' value of  $t = 13.656$  between the pretest

and post test lower extremity perfusion score in experimental group was found to be statistically significant at  $p < 0.001$  level.

The calculated paired 't' value of  $t = 1.722$  between the pretest and post test lower extremity perfusion score in control group was not found to be statistically significant at  $p < 0.05$  level. The calculated unpaired 't' value of  $t = -0.030$  between the pretest of experimental and control group was not found to be statistically significant. The calculated unpaired 't' value of  $t = 5.114$  between the lower extremity perfusion scores of experimental and control group was found to be statistically significant at  $p < 0.001$  level. The above findings clearly indicates that in the post test Buerger Allen exercise was found to be effective on lower extremity perfusion among type 2 diabetes mellitus patients in the experimental group than the patients in the control group.

## Conclusion

In conclusion the study findings show that Buerger Allen exercise was effective for the management of lower limb perfusion among the patient with type 2 diabetes mellitus. Major finding shows that there is a difference in the level of lower extremity perfusion before and after administration of Buerger Allen exercise among patient with type 2 diabetes mellitus in experimental group. It was statistically significant at ( $p < 0.001$ ). There is a significant improvement in the level of lower limb perfusion in experimental group after Buerger Allen exercise than the control group among patient with type 2 diabetes mellitus at ( $p < 0.001$ ).

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