

A Study to Evaluate the Effectiveness of Buerger Allen Exercise in Improving Peripheral Vascular Tissue Perfusion among Clients with Type II Diabetes Mellitus in Selected Hospital at Maharashtra

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Abstract: *The study was aimed to evaluate the effectiveness of Buerger Allen Exercise in improving peripheral vascular tissue perfusion among clients with type II diabetes mellitus in selected hospital at Maharashtra.” A Quantitative research approach was used for the study. Research design was Pre experimental, one group pre test – post test design, Sampling Technique used was Non probability purposive sampling technique was used. A total of 100 Type 2 diabetes mellitus patients were selected based on inclusion and exclusion criteria. . Pre-test based on Ankle Brachial Index was conducted and Buerger Allen Exercise is demonstrated by researcher and it was return demonstrated & post-test was conducted .Collected data was analyzed using descriptive and inferential statistics. When pre test ABI was compared with Post test ABI using paired t test, it was found that there was a mean difference of 0.09050 and this difference was statistically significant (p <0.05).The data identified from the present study shows that the Buerger Allen Exercise was effective in Improving Peripheral Vascular Tissue Perfusion among clients with type II diabetes mellitus. Hence H1 is accepted.*

Keywords: Effectiveness, Ankle Brachial index, Peripheral Vascular Tissue Perfusion, Buerger Allen exercise

1. Introduction

Diabetes is a serious, chronic disease that occurs either when the pancreas does not produce enough insulin (a hormone that regulates blood glucose), or when the body cannot effectively use the insulin it produces ¹. More than 422 million people live with diabetes. Peripheral arterial disease is more frequent in those with diabetes . Epidemiological evidence confirms the association between Diabetes mellitus and increased the prevalence of peripheral arterial disease. Individuals with diabetes mellitus have a two to fourfold increase in the rate of peripheral arterial disease. Diabetes mellitus causes between two and four times increased risk of Peripheral Arterial Disease (PAD) by causing endothelial and smooth muscle cell dysfunction in peripheral arteries. The risk of developing lower extremity peripheral arterial disease is proportional to the severity and duration of diabetes.² Peripheral artery disease has become a global problem in the 21st century and can no longer be regarded as a disease that affects mostly high-income countries. The dramatic growth in PAD is already a major public health challenge due to loss of mobility, diminished quality of life, and the significantly increased risk of heart attack and stroke." (Gerry Fowkes: 2013). Buerger allen Exercise is one of the intervention to stimulate the development of collateral circulation in the legs & will improve the peripheral vascular perfusion. the investigator felt that nurses have an important role in educating the patients regarding supervised exercise like buerger allen exercise for improving the lower extremity among diabetic patients and all diabetes mellitus Clients should do the Buerger Allen exercise to improve peripheral vascular tissue perfusion. So there is a need to assess the effectiveness of buerger Allen exercise in

improving the peripheral vascular tissue perfusion among diabetic patients.

Considering the above factors, the investigator felt that all diabetes mellitus patients should do the Buerger Allen exercise to improve lower extremity perfusion.

Statement of the problem

“A study to evaluate the effectiveness of Buerger Allen Exercise in improving peripheral vascular tissue perfusion among clients with type II diabetes mellitus in selected hospital at Maharashtra.”

Objectives of the study

- 1) To assess the Peripheral Vascular Tissue Perfusion among Clients with Type II Diabetes Mellitus before administering Buerger Allen exercise.
- 2) To assess the Peripheral Vascular Tissue Perfusion among Clients with Type II Diabetes Mellitus after administering Buerger Allen exercise.
- 3) To determine the effectiveness of Buerger Allen Exercise in Improving Peripheral Vascular Tissue Perfusion among clients with type II diabetes mellitus.
- 4) To find out the association between pre tests levels of Peripheral Vascular Tissue Perfusion with their selected demographic variables.

Hypotheses:

H0 – There will be no significant relation between peripheral Vascular tissue perfusion and buerger Allen exercise among type 2 diabetes mellitus.

H1 – There will be a significant relation between peripheral circulation and buerger Allen exercise among type 2 diabetes mellitus

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2. Methodology

Approach-Quantitative Approach

Research design—Pre experimental, one group pre test – post test design

Independent variable-Buerger Allen Exercise

Dependent variable- Peripheral Vascular Tissue Perfusion among type –II Diabetes Mellitus clients.

Setting- Dr Ulhas Patil Medical College, Jalgaon, Maharashtra.

Population- Patients with type II Diabetes Mellitus Who are admitted at Dr Ulhas Patil Medical College, Jalgaon, Maharashtra.

Sample and sampling technique

The sample of the present study comprised of 100 Type II Diabetes Mellitus patients admitted at Dr Ulhas Patil Medical College, Jalgaon, Maharashtra. In present study the samples were selected by Non Probability, Purposive sampling technique.

3. Data collection method and tool

Part I

Part I consist of items related to socio demographic data of clients with type 2 Diabetes Mellitus such as Age, Sex, Educational qualification, Dietary pattern, BMI,duration of illness, Habits, Family history of diabetes, Comorbidities

Part II

Part II consist of Ankle Brachial Index Scale. It is the ratio between the highest Ankle systolic pressure and highest brachial systolic pressure. Divide the higher of the Dorsalis pedis systolic pressures for each ankle by the higher of the two upper extremity brachial systolic pressures to obtain the ankle brachial index for each of the lower extremities. Upon completing calculations, compare each reading with the interpretations below.

Ankle Brachial Index = Highest ankle pressure / Highest brachial arm pressure

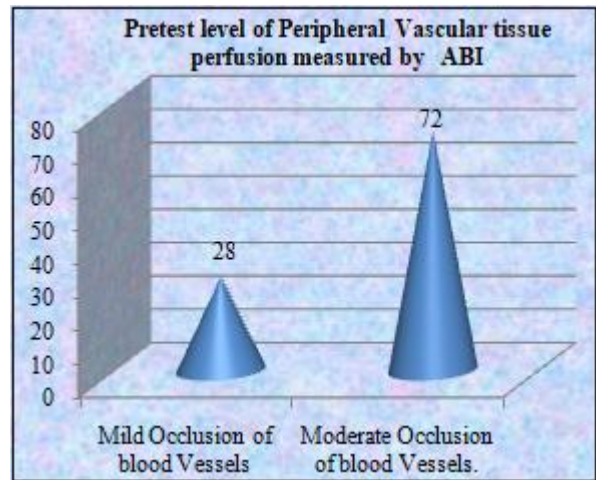
Score Interpretation

Ankle Brachial Index Score	Interpretation of the ABI score
>0.9	Normal perfusion.
0.71-0.9	Mild Occlusion of blood Vessels
0.41-0.70	Moderately occluded blood vessels.
<0.4	Severely occluded blood vessels.

4. Results

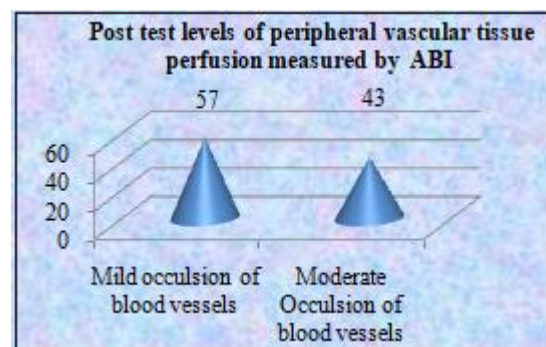
Frequency & Percentage distribution of post-test scores of peripheral vascular tissue perfusion measured by ABI

Peripheral vascular tissue perfusion measured by ankle brachial index	Pre test	
	Frequency	Percentage
Mild Occlusion of blood Vessels	28	28.0
Moderate Occlusion of blood Vessels	72	72.0
Total	100	100.0



Frequency & Percentage distribution of post-test scores of peripheral vascular tissue perfusion measured by ABI

Peripheral vascular tissue perfusion measured by ankle brachial index	Post test	
	Frequency	Percentage
Mild Occlusion of blood Vessels	57	57.0
Moderate Occlusion of blood Vessels.	43	43.0
Total	100	100.0

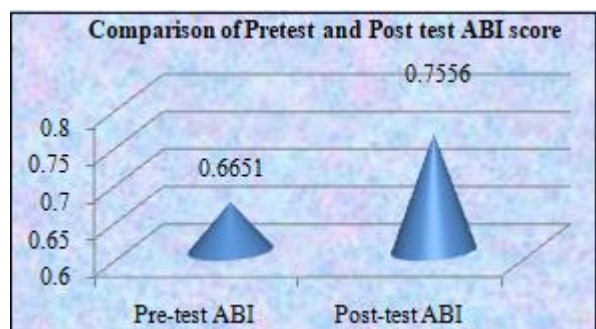


Analysis of the Effectiveness of Buerger Allen Exercise in Improving Peripheral Vascular Tissue Perfusion among Type –II Diabetic Clients

Comparison of Pre test ABI and Post test ABI

	Mean	N	Std. Deviation	Mean difference	t value
Pre-test ABI	.6651	100	.08514	.09050	19.108049*
Post-test ABI	.7556	100	.09601		

*Statistically Significant (P<0.05)



Association Between pre test scores of peripheral vascular tissue perfusion and Selected demographic variables based on ABI.

Sl. No.	Demographic variables	Categories	Pre-test Scores		Total	Chi square value	P Value	Association
			Mild	Moderate				
1	Age	31 - 40 years	9	22	31	.890	.808	NS
		41 - 50 years	13	30	43			
		51 - 60 years	4	10	14			
		61 and above	2	10	12			
2	Gender	Male	16	37	53	.268	.605	NS
		Female	12	35	47			
3	Education	No formal education	2	2	4	7.208	.066	NS
		Primary education	5	26	31			
		Secondary education	19	31	50			
		Graduation and above	2	13	15			
4	Dietary Pattern	Vegetarian	16	47	63	.572	.494	NS
		Mixed	12	25	37			
5	Body Mass Index	less than 18(underweight)	3	8	11	4.388	.222	NS
		18 - 24 (Normal)	17	30	47			
		25 - 30 (overweight)	5	28	33			
		more than or equal to 30 (obese)	3	6	9			
6	Duration of Illness	less than 5 years	3	3	6	1.633	.652	NS
		6 - 10 years	18	49	67			
		11 -15 years	6	18	24			
		more than 15 years	1	2	3			
7	Habits	Smoking	3	15	18	14.358	.006	NS
		Alcoholism	9	18	27			
		Both	11	8	19			
		Others	2	21	23			
		None	3	10	13			
8	Family History	Yes	24	63	87	.057	.753	NS
		No	4	9	13			
9	Comorbidity	Hypertension	7	22	29	3.639	.303	NS

5. Discussion

Major findings of the study

- 1) Regarding age, most of the subjects i.e. (43%) were in the age group of 41 -50 years, (31%) were in the age group of 31-40 years, (14%) of them were in the age group of 51-60 years and only (12%) of clients were above 61 years.
- 2) In gender, majority of the subjects (53%) were Males and (47%) were Females.
- 3) Regarding education most of the subjects (50%) completed secondary education, (31%) had primary education; (15%) completed graduation & above and (4%) had no formal education.
- 4) Regarding Dietary pattern most of subjects (63%) were Vegetarian & 37% were Mixed.
- 5) According to Body mass index majority of the subjects (47%) were in the normal range, (33%) were overweight, (11%) were under weight & 9% were obese.
- 6) About Duration of illness, majority of the subjects (67%) were in 6-10 years of duration, (24 %) were in 11-15 years duration, (6% %) were less than 5 years and (3%) were having more than 15 years duration of illness.
- 7) Regarding habits ,majority of subjects (27%)were alcoholics , (18%) were smokers, (19%) have both alcoholism and smoking ,(23%) were having other habits other than alcoholism and smoking & (13%) of them were not having any bad Habits.
- 8) Regarding family history, 87% of the subjects were having family history of type –II diabetes Mellitus and 13% were not having any family history.
- 9) Regarding co morbidities, 29% were having hypertension, 26% were having Dyslipidemia, (29%)

were having both hypertension & Dyslipidemia, & (16%) belongs to others.

The first objective was to assess the Peripheral Vascular Tissue Perfusion among Clients with Type II Diabetes Mellitus before administering Buerger Allen exercise.

The overall Pre test ABI scores regarding the Peripheral Vascular Tissue Perfusion among Clients with Type II Diabetes Mellitus shows that majority of clients i.e.; 72 (72%) had moderate reduction in Peripheral Vascular Tissue Perfusion & 28(28%) had mild reduction in Peripheral Vascular Tissue Perfusion . overall mean, standard deviation and standard error mean of Pre test regarding Peripheral Vascular Tissue Perfusion among Clients with Type II Diabetes Mellitus were 0.6651,0.08514 and 0.00851 respectively.

The second objective was to assess the Peripheral Vascular Tissue Perfusion among Clients with Type II Diabetes Mellitus after administering Buerger Allen exercise.

The overall Post test ABI scores regarding the Peripheral Vascular Tissue Perfusion among Clients with Type II Diabetes Mellitus shows that majority of clients i.e.; 57 (57%) had mild reduction in Peripheral Vascular Tissue Perfusion & only 43(43%) had moderate reduction in Peripheral Vascular Tissue Perfusion . overall mean, standard deviation and standard error mean of Post test regarding Peripheral Vascular Tissue Perfusion among Clients with Type II Diabetes Mellitus were 0.7556,0.09601 and 0.00960 respectively.

The third objective was to determine the effectiveness of Buerger Allen Exercise in Improving Peripheral Vascular Tissue Perfusion among clients with type II diabetes mellitus.

After administration of Buerger Allen Exercise post test was conducted by using ABI Scale. This study findings reveals that the post-test mean score of ABI was 0.7556, with standard deviation of 0.09601 and paired t value of ABI was 19.108049 which is statistically significant at $p < 0.05$ level. When pre test ABI was compared with Post test ABI using paired t test, it was found that there was a mean difference of 0.09050 and this difference was statistically significant ($p < 0.05$). The data identified from the present study shows that the Buerger Allen Exercise was effective in Improving Peripheral Vascular Tissue Perfusion among clients with type II diabetes mellitus. Hence H1 is accepted.

The fourth objective was to find out the association between pre tests levels of Peripheral Vascular Tissue Perfusion with their selected demographic variables.

The Chi-square test was computed to determine the association between the pre-test score of Peripheral Vascular Tissue Perfusion with the selected demographic variables based on ABI.

The result revealed that there was no significant association between the pre test score of Peripheral Vascular Tissue Perfusion with age, sex, education, occupation, Dietary Pattern, BMI, Duration of Illness, Habits, Family History & Comorbidity.

6. Conclusion

The study concluded that Buerger Allen Exercise was effective in Improving Peripheral Vascular Tissue Perfusion among clients with type II diabetes mellitus

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