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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 Ratnagiri Dist 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 Ratnagiri Dist Maharashtra.". A Quantative 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 50 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 0.0376 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.

2. 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 Ratnagiri Dist ,Maharashtra."

3. 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

4. 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- BKL Walawalkar Hospital & Research Centre,Chiplun,Ratnagiri Dist,Maharashtra

Population- Patients with type II Diabetes Mellitus Who are admitted at BKL Walawalkar Hospital & Research Centre.

Sample and Sampling Technique
The sample of the present study comprised of 50 Type II Diabetes Mellitus patients admitted at at BKL Walawalkar Hospital & Research Centre. In present study the samples were selected by Non Probability, Purposive sampling technique.

5. 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

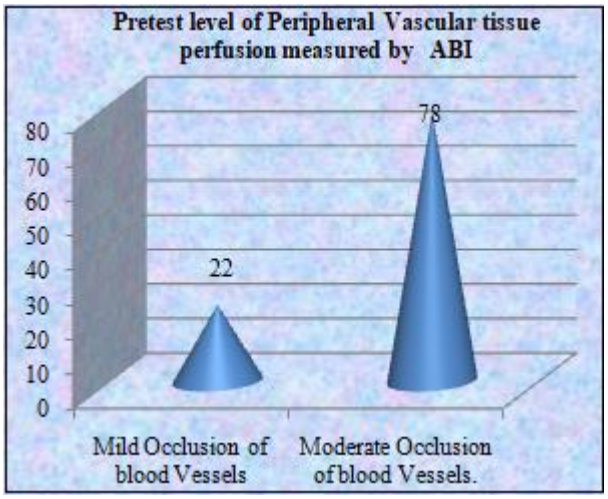
Score Interpretation

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.

6. Results

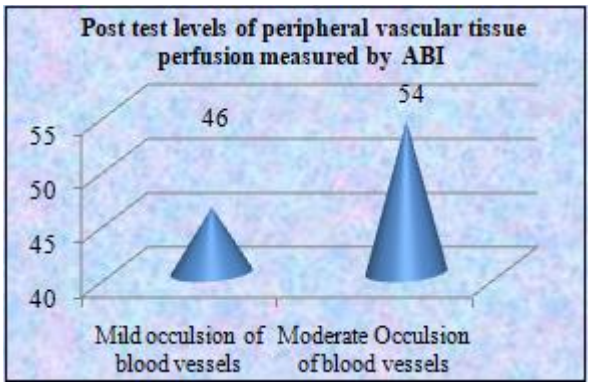
Frequency & Percentage distribution of post-test scores of peripheral vascular tissue perfusion measured by ABI

Peripheral Vascular Tissue Perfusion Measured by Ankle Brachial Index	pre test	
	Frequency	Percentage
Mild Occlusion of blood Vessels	11	22.0
Moderate Occlusion of blood Vessels	39	78.0
Total	50	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	23	46.0
Moderate Occlusion of blood Vessels	27	54.0
Total	50	100.0

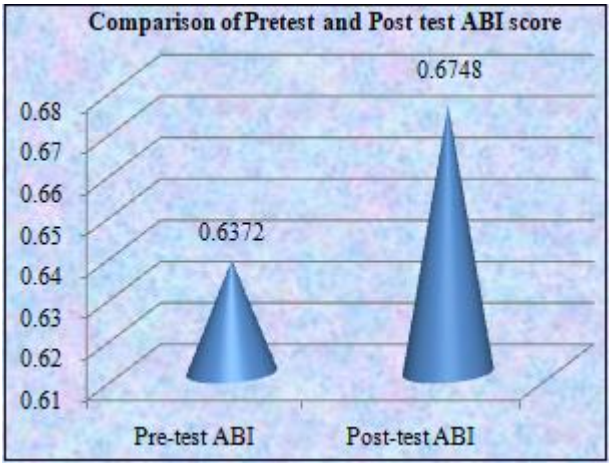


Analysis of the Effectiveness of Buerger Allen Exercise in Improving Peripheral Vascular Tissue Perfusion among Type –II Diabetic Clients

Comparison of Pre test ABI and Post test ABI

		Mean	N	Std. Deviation	Mean difference	t value
	Pre-test ABI	.6372	50	.0949	.0376	10.689660
	Post-test ABI	.6748	50	.0831		

p-value is 0.00000289 .The P value is <0.00001.The result is significant at p<.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	6	13	19	0.6523	0.884359	NS
		41 - 50 years	3	14	17			
		51 - 60 years	2	9	11			
		61 and above	1	3	3			
2	Gender	Male	7	24	31	0.016	.899255	
		Female	4	15	19			
3	Education	No formal education	1	1	2	2.057	.560652	NS
		Primary education	2	14	16			
		Secondary education	7	22	29			
		Graduation and above	1	2	3			
4	Dietary Pattern	Vegetarian	3	26	29	5.466	.01939	S
		Mixed	8	13	21			
5	Body Mass Index	less than 18(underweight)	2	5	7	3.0347	.386306	NS
		18 - 24 (Normal)	3	20	23			
		25 - 30 (overweight)	3	10	13			
		more than or equal to 30 (obese)	3	4	7			
6	Duration of Illness	less than 5 years	3	1	4	8.8578	.031242	S
		6 - 10 years	4	21	25			
		11 -15 years	2	14	16			
		more than 15 years	2	3	5			
7	Habits	Smoking	1	8	9	4.9104	.296614	NS
		Alcoholism	3	8	11			
		Both	5	7	12			
		Others	1	11	12			
		None	1	5	6			
8	Family History	Yes	8	26	34	.1448	.703525	NS
		No	3	13	16			
9	Comorbidity	Hypertension	4	13	17	0.5567	.906262	NS
		Dyslipidemia	4	11	15			
		Both	2	11	13			
		Others	1	4	5			

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.; 39 (78%) had moderate reduction in Peripheral Vascular Tissue Perfusion & 11(22%) 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 0.6372, 0.0949 and 0.01343 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 0.6748, 0.0831 and 0.01176 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 0.6748, with standard deviation of 0.0831 and paired t value of ABI was 10.689660 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 0.0118 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 a significant association between the pre test score of Peripheral Vascular Tissue Perfusion with Dietary Pattern & Duration of Illness.

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

7. Conclusion

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

References

[1] Diabetes [Internet]. World Health Organization. World Health Organization; [cited 2019Dec24]. Available from: https://www.who.int/news-room/fact-sheets/detail/diabetes
[2] Sarwar N, Gao P, Seshasai SR, Gobin R, Kaptoge S, Di Angelantonio E, Ingelsson E, Lawlor DA, Selvin E, Stampfer M, Stehouwer CD, Lewington S, Pennells L, Thompson A, Sattar N, White IR, Ray KK, Danesh J. Diabetes mellitus, fasting blood glucose concentration, and risk of vascular disease: a collaborative meta-analysis of 102 prospective studies. Lancet. 2010 Jun 26;375(9733):2215-22. doi: 10.1016/S0140-6736(10)60484-9.
[3] Gianna m Rodrighuer , Brine .M. Kelly , M Catherine Spires: Vascular disease and rehabilitation :2008 dec 18, http://emedicine.medscape .com /article.
[4] Society of statistics-peripheral vascular: disease:http://www.wrongdiagnosis.com/p/peripheral_vascular_disease/stats
[5] Allen, A.W. (1930) Recent Advances in the Treatment of Circulatory Disturbances of the Extremities. Annals of Surgery, 92, 931-946. [Citation Time(s):2]
[6] Bernheim, A.R. and London, I.M. (1937) Arteriosclerosis and Thromboangiitis Obliterans. JAMA, 108, 2102-2109. http://dx.doi.org/10.1001/jama.1937.02780250016005 [Citation Time(s):1]
[7] Bierman, W. (1949) Physical Medicine in Peripheral Vascular Diseases. JAMA, 141, 318-320. http://dx.doi.org/10.1001/jama.1949.02910050018005
[8] Brandaleone, H., Standard, S. and Ralli, E.P. (1937) Prophylactic Foot Treatment in Patients with Diabetes Mellitus. Annals of Surgery, 105, 120-124. http://dx.doi.org/10.1097/00000658-193701000-00011 [Citation Time(s):1]
[9] Buerger, L. (1926) The Circulatory Disturbances of the Extremities. Annals of Surgery, 83, 157. [Citation Time(s):1]
[10] McKittrick, L.S. and Pratt, T.C. (1930) The Operative Treatment of Lesions of the Lower Extremities in Diabetes Mellitus. JAMA Surgery, 21, 555 581. http://dx.doi.org/10.1001/archsurg.1930.01150160002001 [Citation Time(s):2