

A study to assess the effectiveness of Buerger Allen Exercise on Lower Extremity Perfusion among clients with diabetes mellitus.

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Abstract— Diabetes is a chronic disease that occur when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin it produces. Insulin is a hormone that regulates blood glucose. Hyperglycemia is a common effect of uncontrolled diabetes mellitus which leads to serious damage to many of the body's systems, especially the nerves and blood vessels. Buerger Allen exercise is an active postural exercise in which gravity alternatively fills and empties the blood vessels for preventing vascular diseases and promoting collateral circulation in lower extremities. Hence, maintenance of lower extremity perfusion should be a primary concern to make our lifestyle healthy. This study helps to enhance the effectiveness of the Buerger Allen exercise on the lower extremity perfusion among clients with type 2 diabetes mellitus. The present study was aimed is to find the effectiveness of Buerger Allon exercise on Lower Extremity Perfusion among clients with diabetes mellitus in selected area of Amritsar, Punjab. Ankle Brachial Index (ABI) score was used to collect data from sample of 54 clients who had type 2 diabetes mellitus. Pre-experimental one group pre-test post-test design was selected using purposive sampling technique. The present study was aimed is to find the effectiveness of Buerger Allen exercise on Lower Extremity Perfusion among clients with diabetes mellitus in selected area of Amritsar, Punjab. Ankle Brachial Index (ABI) score was used to collect data from sample of 54 clients who had type 2 diabetes mellitus. Pre-experimental one group pre-test post-test design was selected using purposive sampling technique. The results of the study showed the significant difference in pre-interventional and post-interventional lower extremity perfusion among clients with diabetes mellitus. The mean difference between pre-interventional and post-interventional left and right lower extremity perfusion among clients with diabetes mellitus was found statistically significant at $p < 0.001$ with t value -10.756 at $p < 0.01$ and in right level of perfusion it was found statistically significant at $p < 0.001$ with t value -14.283 . Hence, it can be concluded that Buerger Allen exercise were effective in lower extremity perfusion so it is important to encourage Buerger Allen exercise as a natural measure for improving lower

extremity perfusion among clients with diabetes mellitus to maintain health, functional independence and quality of life.

Index Terms- Effectiveness, Buerger Allen exercise, Lower extremity perfusion, clients, diabetes mellitus.

I. INTRODUCTION

World Health Organization defines diabetes mellitus as a metabolic disorder of multiple etiology characterized by chronic hyperglycemia with the disturbance of carbohydrates, fats and protein metabolism resulting from defects in insulin secretion, insulin action or both. Poorly controlled diabetes is associated with long term damage, dysfunction and failure of various organs especially the eyes (retinopathy) which is leading cause of blindness especially in diabetes adults, kidneys (nephropathy) 10 to 20% of diabetes mellitus patient die from renal diseases, nerves (nephropathy) which affect up to 50% of diabetes mellitus patients in cardiovascular and cerebrovascular disease whereas the rate of heart disease and stroke in diabetes adults is 2-4 times higher than those of the patients without diabetes.¹

Buerger Allen Exercise is one of the type of exercise performed to promote lower extremity perfusion this accelerating the recovery from wounds and lowering peripheral neuropathy symptoms among diabetes mellitus patients. Buerger Allen Exercise is an active postural exercise in which gravity alternatively fills and empties the blood vessels for preventing vascular diseases and promoting collateral circulation in lower extremities.²

It is estimated that more than 25.8 million people inside the United States have diabetes, although

almost one third of these cases are undiagnosed. About 1.9million more adults over the age of 20 had a new diabetes diagnosis in 2010 than in 2009. In 2000, the worldwide estimate of the incidence of diabetes was 171 million people, and by 2030, this is expected to rise in more than 360 million (World Health Organization, 2012). Diabetes is especially prevalent in older adults.³

II. MATERIAL AND METHODS

In this study, quantitative research approach was followed as it aimed to assess the effectiveness of Buerger Allen Exercise on Lower Extremity Perfusion among clients with diabetes mellitus. A Pre-experimental one group pre-test post-test design was used. The sample size was 54 clients (one group pre-test and post-test design). Purposive sampling technique was used to select sample from the population. Prior to data collection procedure, the formal permission was obtained. Prior to assessment of lower extremity perfusion, investigator gave self-introduction to the subjects and explained the purpose of providing intervention and rapport was established with the subjects and they were assured that their data would be kept confidential and the information would be used only for research purpose. Subjective data was obtained from the clients. Before intervention, lower extremity perfusion was checked and Buerger Allen exercises were demonstrated twice a day for five days, the clients gave re- demonstration and lower extremity perfusion was assessed on 5th day by using standardized Ankle Brachial Index.

III. RESULTS

Table depicts the comparison of pre-interventional and post-interventional left and right lower extremity perfusion among clients with diabetes mellitus. It shows that in Left LEP, mean (1.20) of post interventional lower extremity perfusion is greater than the mean (.85) of pre interventional lower extremity perfusion and in Right LEP, mean (1.24) of post interventional lower extremity perfusion is greater than themean (.85) of pre interventional lower extremity perfusion. The mean difference between pre-interventional and post -interventional of left level of perfusion was statistically significant at $p < 0.001$ with t value -10.756 at $p < 0.001$ and in right level of

perfusion it was found statistically significant at $p < 0.001$ with t value -14.283.

Hence, it can be concluded that the effectiveness of Buerger Allen exercise on Lower Extremity Perfusion among clients with diabetes mellitus had significant effect.

Comparison of pre-interventional and post-interventional Lower Extremity Perfusion among clients with Diabetes Mellitus.

	Mean	SD	Mean	SD
Pre-interventional	.385	.056	.85	.056
Post-interventional	1.20	.228	1.24	.193
	df	t	df	t
	53	-10.756***	53	-14.283***

*** significant at $p < 0.001$

IV. DISCUSSION

The analysis of data regarding comparison of mean score of pre-interventional and post-interventional lower extremity perfusion among clients with diabetes mellitus revealed that in left LEP, mean (1.2046) of post-interventional lower extremity perfusion is greater than mean (.8504) of pre-interventional lower extremity perfusion. In right LEP, mean (1.2465) of post-interventional lower extremity perfusion is greater than mean (.8572) of pre-interventional lower extremity perfusion. This was supported by the study on effectiveness of Buerger Allen exercise on improvement of lower extremity perfusion among patients with type 2 diabetes mellitus in Tertiary care hospital, Kochi, Kerala. Which showed that in left LEP, mean (0.984) of post-interventional lower extremity perfusion is greater than mean (0.063) of pre-interventional lower extremity perfusion. In right LEP, mean (0.068) of post-interventional lower extremity perfusion is greater than (0.10864) of post-interventional lower extremity perfusion. The mean difference between pre- interventional and post-interventional of left LEP, was found statistically significant with $(t = -10.756)$ at $p < 0.001$ and in right LEP, was found statistically significant with $(t = -14.283)$ at $p < 0.001$. Hence, it can be concluded that the Buerger Allen exercise had significant effect on

lower extremity perfusion among clients with diabetes mellitus. So, null hypothesis is rejected.⁴

CONCLUSION

This is concluded that Buerger Allen exercise is effective in lower extremity perfusion. So, it is crucial to encourage the use of exercise as complementary measure for lower extremity perfusion among clients with type 2 diabetes mellitus to maintain health, functional independence and standard life quality.

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