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Effectiveness of Buerger Allen Exercise on Lower Extremity Perfusion and Pain among Patients with Type 2 Diabetes Mellitus in Selected Hospitals in Chennai

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Abstract: ***A quasi experimental study was conducted to assess the effectiveness of Buerger Allen exercise on lower extremity perfusion and pain among patients with type 2 Diabetes Mellitus admitted in selected hospitals, Chennai. It was conducted among 60 samples with type 2 diabetes mellitus by using non probability purposive sampling technique. Pre test was conducted to assess the level of pain and lower extremity perfusion and Buerger Allen exercise was administered for the experimental group for a period of five days and post test was conducted on the sixth day. Comparison of pre and post test findings showed that in the experimental group, the mean score of level of lower extremity pain was reduced from 4.33 to 1.30. The reduction of pain was statistically significant difference at 1% level of significance (p=0.001). The mean score of level of lower extremity perfusion was increased from 44.50 to 52 and it showed a statistically significant difference at 1% level of significance (p=0.001).***

Keywords: Buerger Allen exercise; type 2 diabetes mellitus; lower extremity perfusion and pain

1. Introduction

Diabetes Mellitus is a metabolic disorder that is characterized by increased levels of glucose in the blood resulting from defects in insulin secretion, insulin action, or both. Diabetes Mellitus causes, between two and four times increased risk of peripheral vascular disease by causing endothelial and smooth muscle cell dysfunction in peripheral arteries. The risk of developing lower extremity peripheral vascular disease is proportional to the severity and duration of diabetes. Most of the complications are preventable. It requires a lifelong commitment to staying healthy, maintaining weight, exercising, taking medications, as prescribed by doctor. Exercise is the fundamental principle for preventing the Peripheral vascular diseases among diabetes patients. One of the exercises is Buerger Allen exercise, is an active postural exercise of the feet and legs for preventing peripheral vascular disease and promoting collateral circulation in lower extremities.

2. Statement of the Problem

A study to assess the effectiveness of Buerger Allen exercise on lower extremity perfusion and pain among patients with type 2 Diabetes Mellitus admitted in selected hospitals, Chennai.

Objectives

- To assess the pre and post test level of lower extremity perfusion and pain among patients with type 2 Diabetes Mellitus in experimental and control group.
- To assess the effectiveness of Buerger Allen exercise on lower extremity perfusion and pain among patients with type 2 Diabetes Mellitus.
- To associate the post test level of lower extremity perfusion and pain with selected demographic variables and clinical variables among patients with type 2 diabetes mellitus in both experimental and control group.

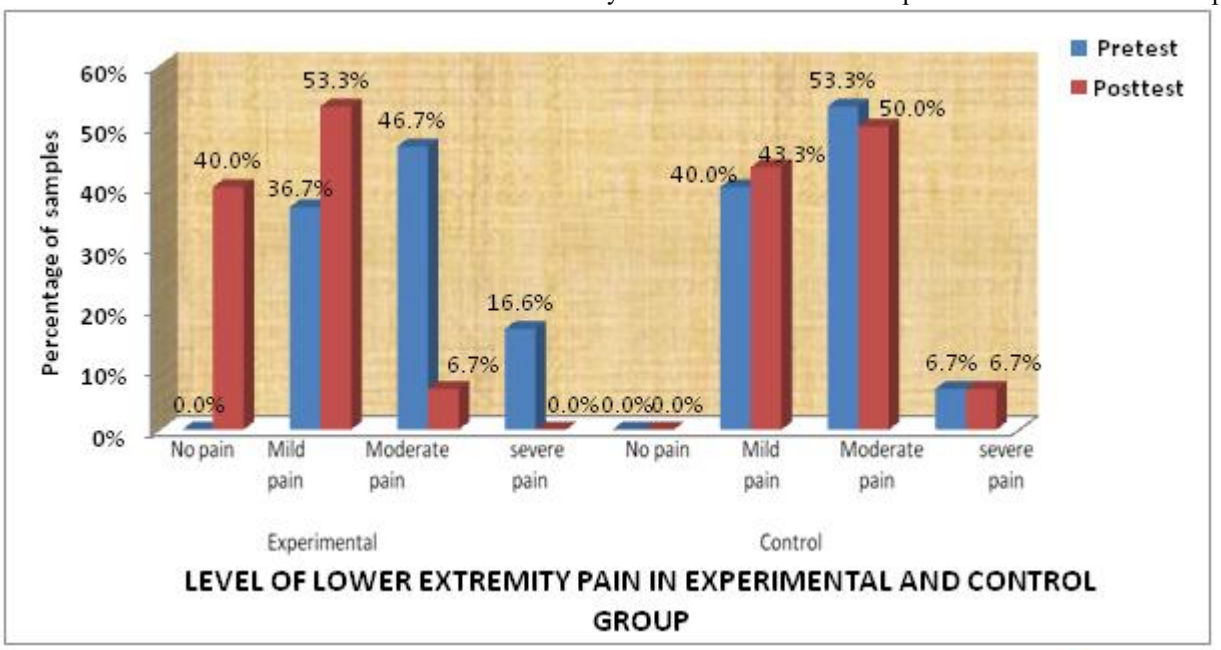
3. Methodology

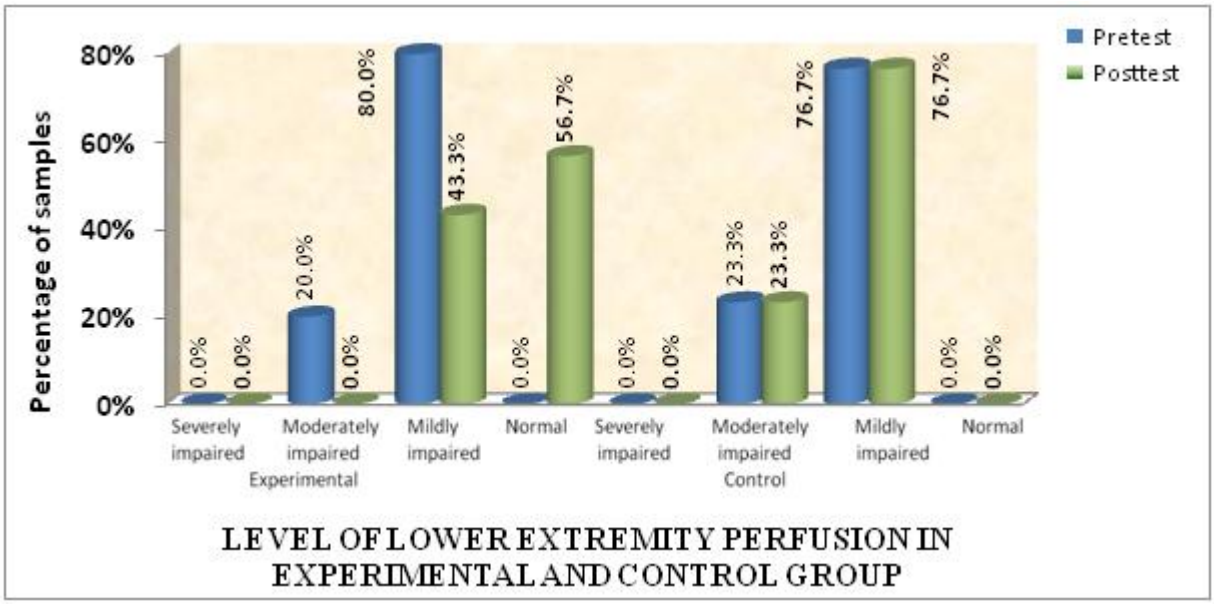
The research approach was experimental in nature and quasi experimental pre test and post test control group design was used. The study was conducted among 60 samples with type 2 diabetes mellitus. Thirty samples in experimental group and 30 samples in control group were selected by using non probability purposive sampling technique. Pre test was conducted using structured interview schedule, modified Wong Baker FACES pain assessment scale, modified Clarke enhanced foot assessment scale. For the experimental group, the investigator demonstrated the Buerger Allen exercise and were asked to do the exercise three times a day at four hours interval (8am, 12noon, and 4pm) for a period of five days under the supervision of investigator. Post assessment was done on the sixth day by using the same scale.

4. Results

Comparison of pre and post test findings showed that in the experimental group, the mean score of level of lower extremity pain was reduced from 4.33 to 1.30. The reduction of pain was statistically significant difference at 1% level of significance (p=0.001). The mean score of level of lower extremity perfusion was increased from 44.50 to 52 and it showed a statistically significant difference at 1% level of significance (p=0.001). There was a statistically significant association found between post test level of lower extremity pain with demographic variables such as age, dietary pattern. Regarding lower extremity perfusion, the post test result showed a statistically significant association with age and specific habits such as smoking and alcoholism.

Assessment of Pre and Post Test Level of Lower Extremity Perfusion and Pain for Experimental and Control Group





Comparison of Level of Lower Extremity Perfusion and Pain among Experimental and Control Group
N=60 O_1=30, O_2=30

Variables	Test	N	Experimental group		Control group		Mean difference	Student independent t test
			Mean score	SD	Mean score	SD		
Lower extremity pain	Pre test	30	4.33	1.88	4.00	1.46	0.33	t=0.76 P=0.44
	Post test	30	1.30	1.34	3.83	1.64	2.53	t=6.54 P=0.001***
Lower extremity perfusion	Pre test	30	44.50	4.61	44.23	4.96	0.27	t=1.89 P=0.06
	Post test	30	52.00	3.31	44.57	4.84	7.43	t=19.03 P=0.001***

O_1=Experimental group O_2= Control group *** denotes significant at P≤0.001

Association of Post Test Level of Lower Extremity Pain With Selected Demographic and Clinical Variables of Samples in Experimental Group and in Control Group, N=30

Demographic variables	*Post test level of pain*						*Total*	*Chi square*
	No pain		*Mild pain*		*Moderate pain*			
	F	*%*	*F*	*%*	*F*	*%*		
Age								
a) 41years-45years	1	100	0	0.00	0	0.00	1	
b) >45years-50years	2	66.7	1	33.3	0	0.00	3	$\chi2$=16.45
c) >50years-55years	5	71.4	2	28.6	0	0.00	7	P=0.03*
d) >55years-60years	3	60.0	2	40.0	0	0.00	5	S
e) >60years-65years	0	0.00	12	85.7	2	14.3	14	
Dietary pattern								$\chi2$=9.24
a) Vegetarian	9	64.3	5	35.7	0	0.00	14	P=0.01**
b) Non vegetarian	2	12.5	12	75.0	2	12.5	16	S
Gender								$\chi2$=2.56
a) Male	2	18.2	8	72.4	1	9.1	11	P=0.27
b) Female	9	47.4	9	47.4	1	5.3	19	NS
Specific habits								$\chi2$=5.50
a) Smoking	-	-	6	85.7	1	4.8	7	P=0.23
b) Tobacco chewing	1	50	1	50	1	14.3	2	NS
Duration of type 2 Diabetes Mellitus								
a) 5years-10years	6	85.7	1	14.3	0	0.00	7	$\chi2$=15.42
b) >10years-15years	4	40.0	6	60.0	0	0.00	10	P=0.05*
c) >15years-20years	3	50.0	3	50	0	0.00	6	S
d) >20years-25years	0	33.3	2	66.7	1	33.0	3	
e) >25years	0	0.00	3	75.0	1	25.0	4	
Associated illness								
a) Hypertension	3	23.1	9	69.2	1	7.7	13	$\chi2$=2.34
b) Cardiac problems	5	45.5	5	45.5	1	9.1	11	P=0.67
c) Hyperlipidemia	-	-	-	-	-	-	-	NS
d) Renal and respiratory problem	3	50.0	3	50.0	-	-	6	
Nail condition								$\chi2$=7.84
a) Normal	10	52.6	9	47.4	0	0.00	19	P=0.02*
b) Thickened	1	9.1	8	72.7	2	18.2	11	S

NS-Not significant, **S**-Significant (*denotes significant at 5% level)

Association of Post Test Level of Lower Extremity Perfusion with Selected Demographic and Clinical Variables of Samples In Experimental Group and in Control Group, N=30

Demographic variables	*Post test level of perfusion*				*Total*	*Chi square test*
	Mild impairment		*Normal*			
	N	*P (%)*	*N*	*P (%)*		
Age						
a) 41years-45years	0	0	1	100	1	
b) >45years-50years	0	0	3	100	3	$\chi2$=9.98
c) >50years-55years	1	14.2	6	85.8	7	P=0.04*
d) >55years-60years	2	40	3	60	5	S
e) >60years-65years	10	71.4	4	28.6	14	
Gender						$\chi2$=0.88
a) Male	6	54.5	5	45.5	11	P=0.34
b) Female	7	36.8	12	63.2	19	NS
Dietary pattern						$\chi2$=0.62
a) Vegetarian	5	35.7	9	64.3	14	P=0.43
b) Non- Vegetarian	8	50	8	50	16	NS
Specific habits						$\chi2$=6.72
a) Smoking	5	71.4	2	28.5	7	P=0.03*
b) Tobacco chewing	2	100	0	0	2	S
Duration of type 2 Diabetes Mellitus						
a) 5years-10years	0	0	7	100	7	
b) >10years-15years	4	40	6	60	10	$\chi2$=10.04
c) >15years-20years	5	83.3	1	16.7	6	P=0.04*
d) >20years-25years	2	66.7	1	33.3	3	S
e) >25years	2	50	2	50	4	
Associated illness						
a) Hypertension	6	46.2	7	53.8	13	$\chi2$=0.30
b) Cardiac problems	5	45.5	6	54.5	11	P=0.85
c) Hyperlipidemia	-	-	-	-	-	NS
d) Renal and respiratory problem	2	33.3	4	66.7	6	
Nail condition						$\chi2$=6.11
a) Normal	5	26.3	14	73.7	19	P=0.01**
b) Thickened	8	72.7	3	27.3	11	S

NS-Not significant, **S**-Significant (*denotes significant at 5% level)

5. Conclusion

The findings of the present study revealed that there was a significant improvement in lower extremity perfusion and reduction in pain. Therefore it was concluded that Buerger Allen exercise was found to be effective on improving the lower extremity perfusion and reducing pain among patients with type 2 diabetes mellitus.

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