A study to assess the association of post-interventional Lower Extremity Perfusion among clients with diabetes mellitus with weight

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Abstract - Diabetes mellitus is a global health problem. It is a chronic disease and is now growing as an epidemic in both developed and developing countries. People with diabetes develop foot ulcers because of neuropathy, vascular insufficiency, and impaired wound healing. The prevalence of micro and macro vascular complications in Asians are 66.4% and it is 44.2% more than European population. Patients with diabetes mellitus: at higher risk of Lower Extremity Arterial Disease. Peripheral vascular disease, neuropathy, and infection may all contribute to the development of lower extremity arterial disease in diabetes mellitus. Mortality rate is higher in diabetes with Lower Extremity Arterial Disease, particular of foot ulceration, or gangrene.[1] 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. Before assessment of lower extremity perfusion, the investigator gave a 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.

Index terms-Association, Buerger Allen exercise, Lower extremity perfusion, clients, diabetes mellitus.

I. INTRODUCTION

Type 2 diabetes mellitus incidence is rising globally. Type 2 diabetes results from the interaction between a genetic predisposition and behavior and environmental risk factors. Although the genetic basis of type 2 diabetes has yet to be identified. There is strong evidence that such modifiable risk factors such as obesity and physical inactivity are the cause of the disease.[2]

A non-invasive technique for determining vascular status is the ankle-brachial index (ABI). It comprises of the ratio between the systolic blood pressure of the upper extremity and that of the lower extremity, specifically the ankle. One of the measurements of blood vessel diameter is, in which compares blood vessel resistance. Either internal (plaque, intimal tear) or external (soft tissue compression) factors might cause its width to narrow. The ankle-brachial index, a noninvasive diagnostic method, is covered in the activity. It discusses how medical professionals can use the tool to screen, diagnose, treat, and advise patients with a range of vascular-related illnesses.[3]

In India, more than 77 million adults are suffering with diabetes. Researchers predict that this will increase to134 million by 2045. India's cities and metropolitan regions support a way of life that elevates the risk of diabetes by raising a person's body mass index, therefore those who live there are more likely to get the disease.[4]

II. MATERIAL AND METHODS

In this study, quantitative research approach and a pre-experimental one group pre-test post-test design was used as it aimed to assess the effectiveness of Buerger Allen Exercise on Lower Extremity Perfusion among clients with diabetes mellitus. The sample of the present study consisted of clients with type 2 diabetes mellitus, and a purposive sampling technique was used for the study. The sample size was 54 clients (one group pre-test and post-test design). 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

Association of post-interventional Lower Extremity Perfusion among clients with diabetes mellitus with weight (in kg).

Weight (in Kg)	LEFT				RIGHT			
	Normal	Mild	Moderate	Severe	Normal	Mild	Moderate	Severe
≤50	-	-	-	-	-	-	-	-
51-60	23(53.5)	4 (36.4)	-	-	25 (51)	2 (40)	-	-
61-70	19(44.2)	3 (27.3)	-	-	19 (38.8)	3 (60)	-	-
>70	1(2.3)	4(36.4)	-	-	5(10.2)	-	-	-
Total	43 (100)	11(100)	-	-	49 (100)	5 (100)	-	-
		df	χ^2		df	χ^2		
		2	12.089*		2	1.122^{NS}		

*Significant at $p<0.05$

NS= non-significant

Table depicts the association of post-interventional of left and right lower extremity perfusion among clients with diabetes mellitus with weight (in kg). In Left LEP, in normal level of perfusion, maximum (53.5%) clients were having weight 51-60 kg followed by 44.2% were having 61-70 kg and remaining 2.3% of clients were having weight >70 kg. On other hand, in mild level of perfusion, 36.4% clients were having weight 51-60 kg and >70kg each and remaining 27.3% of clients were having weight 61-70 kg. In Right LEP, in normal level of perfusion, 51% clients were having weight 51-60 kg followed by 38.8% of clients were having weight 61-70 kg and remaining 10.2% of clients were having weight >70 kg. On other hand, in mild level of perfusion, 60% clients were having weight of 61-70 kg and remaining 40% of clients were having weight 51-60 kg. In order to explore association of post-interventional left lower extremity perfusion chi- square was calculated i.e. $\chi^2 = 12.089$, df = 2 which was found statistically significant at $p<0.05$ and right lower extremity perfusion chi-square was calculated i.e. $\chi^2 = 1.122^{NS}$, df= 2 which was found statistically non-significant at $p<0.05$.

Hence, it can be concluded that weight had significant association with post- interventional left lower extremity perfusion and no significant association with post-interventional right lower extremity perfusion.

IV. DISCUSSION

The chi square was computed and analysis of data regarding association of post- interventional lower extremity perfusion among clients with diabetes mellitus with socio-demographic variables revealed weight (in kg) had significant association with post-interventional lower extremity perfusion among clients with diabetes mellitus The findings were supported by study on effectiveness of Buerger Allen exercise on improving peripheral circulation on lower extremity perfusion among patients with type 2 diabetes mellitus in Medical University hospital, Egypt (Hanan saber, 2019). The study revealed that weight had a significant association with post-interventional lower extremity perfusion.[5]

V.CONCLUSION

It can be concluded that Buerger Allen exercise is effective in lower extremity perfusion. So, it is crucial to encourage the use of exercise as a complementary measure to improve lower extremity perfusion. It is essential to maintain ideal weight among clients with type 2 diabetes mellitus to prevent disease related complications.

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