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EFFECT OF BURGER ALLEN EXERCISE ON WOUND HEALING PROCESS AMONG THE DIABETIC FOOT ULCER PATIENTS ADMITTED IN SELECTED HOSPITALS

MR.RAMESH MORDI[1], MR.BASAVANT DHUDUM[2]
[1]M.SC NURSING SECOND YEAR B.V.D.U. COLLEGE OF NURSING SANGLI
[2] ASSISTANT PROFESSOR B.V.D.U.COLLEGE OF NURSING SANGLI

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ABSTRACT: Exercise have wide spread benefit for all especially among patients with diabetes mellitus. Exercise improve vascularization and wound healing in the diabetes patient .One of the effective way to improve the wound healing is by performing Buerger Allen Exercise for diabetes foot ulcer patients. It is a fairly simple and cost effective method to improve wound healing process, which is why I have chosen it as the main tool for my study.[1]

Materials and Methods: Quasi experimental pre – test post – test control group design was adopted and Non probability purposive sampling technique was used to select the samples. A total of 60 diabetes patients with foot ulcer have been taken from selected hospitals, and the Buerger Allen exercise was practiced for the selected samples. Condition of the foot ulcer was analyzed before and after the study. Collected data was analyzed using descriptive and inferential statistics. Result:-On an average, in experimental group, wound healing score was 31.20 where as in control group, on an average,wound healing score was 28.87.Conclusion:The type2 diabetic patient with foot ulcer in the Experimental group had improved wound healing of the foot ulcer. So in addition to the pharmacological treatment Buerger Allen exercise can be used as an effective complimentary treatment modality for managing diabetic foot ulcer.

Keywords-Diabetic foot, Diabetes Mellitus, wound assessment, wound healing, Buerger Allen exercise

I. INTRODUCTION

Being healthy should be part of your overall lifestyle. Living a healthy lifestyle can help to prevent chronic diseases and long-term illnesses. Feeling good about yourself and taking care of your health is important for your self-esteem and self-image. Maintain a healthy lifestyle by doing what is right for your body.

When the body cannot effectively use the insulin that if produce or the pancreas does not produce enough insulin, a chronic disease namely diabetesoccurs. Blood sugar is regulated by insulin hormone. Serious damage to nerves and blood vessels is the common effect of uncontrolled diabetes which can be caused by hyperglycemia and raised blood sugar. Almost half of all deaths attributable to high blood glucose, occur before the age of 70 years. WHO estimates that diabetes was the seventh leading cause of death in 2016 [2]

The two main risk factors that causes diabetic foot ulcer are peripheral neuropathy and micro as well as macro vascular ischemia. Peripheral neuropathy causes loss of pain or feelings into the toes, legs and arms due to the distal nerve damage and low blood supply (arthrosclerosis), very less oxygen supply, and eventually death of tissue in feet occurs. Based upon Diabetic foot society of India (2010), about 84% of all lower limb amputations are preceded by foot ulcers in diabetic clients and every single day 110 Indians have a foot or part of their leg got amputated due to diabetic foot ulcer. [3]

Foot problems in diabetic patients account for more hospital admissions than any other long-term complications of diabetes and also result in increasing morbidity and mortality. The diabetic foot syndrome encompasses a number of pathologies, including diabetic neuropathy, peripheral vascular disease, Charcot neuroarthropathy, foot ulceration, osteomyelitis, and the potentially preventable end point amputation. Patients with the diabetic foot can also have multiple diabetic complications and caring for such patients may require attention to many different areas. [4]

II MATERIALS AND METHODS

The study was undertaken to determine the effectiveness of performing Buerger Allen exercise to promote wound healing process among the diabetic patients with diabetic foot ulcer admitted at the selected hospitals.Quasi-experimental research design was adapted. Non probability purposive sampling technique was used to select 60 samples.The tool used for data collection was validated by the experts in the department of Medical & Surgical Nursing. Reliability of the tool was checked by

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using inter rater method and its correlation coefficient r –value is 0.723. This correlation coefficient is higher than 0.7. The instrument was found to be reliable. Informed consent was obtained from the patients. The characteristics of the foot ulcer was pre assessed with help of wound assessment check list in both experimental and control group on first day. Allen Burger exercise given to the control group. Procedure-Keep the Buerger Allen exercise board on the cot. Elevate the lower extremities to an angle of 45 to 90 degree with the help of exercise board. Provided support to the lower extremities to maintain the position. Make the subject to maintain the same position in the same manner until the skin blanches (appears dead white). Lower the feet and the legs below the level of the rest of the body until redness appears (care should be taken that there is no pressure against the back of the knees). Place the legs flat on the bed for a few minutes. Ask the subjects to sit in a relaxed position while each foot is flexed and extended then inverted and everted for 3 minutes till the feet turns entirely pink. Ask the subject to rotate the feet in all the direction. Make the subject to lie quietly for 5 minutes, keeping legs warm with a blanket. [5]

Control group received their routine treatment. The wound assessment was done on eighth day during the intervention period. Post assessment of the wound of the foot ulcer was done with the same check list on the fifteenth day. The evidence of intervention and wound healing were marked. Intervention was done at the bedside. Descriptive (percentage distribution, mean, standard deviation) and inferential statistics (t- test, chi square test) were used to analyze the data and to test hypothesis. The data were then interpreted and discussed based on the objectives of the study, hypotheses and relevant studies from literature reviewed. The data was analyzed andthe findings of the study are as follows

The Comparison of wound assessment scores between experimental and control group showed thatthe post-test average score of experimental group was 31.20 with standard deviation of 1.32. The post-test average score of control group was 28.87 with standard deviation of 1.70. The test statistics value of the unpaired t test was 5.94 with p value 0.000. Here p value less than 0.05, shows significant difference in the wound healing average scores.This can be achieved by intervening the patients problems during the procedure.[11]

III RESULTS

Table -1.Percentage and frequency distribution of demographic variables.

Variables	**Experimental**		**Control**	
	Frequency	Percentage	Frequency	Percentage
Age in years				
51-60	13	43.33	14	46.67
61-70	11	36.67	10	33.33
71-80	6	20.00	6	20.00
Gender				
Male	22	73.33	22	73.33
Female	8	26.67	8	26.67
Dietary Pattern				
Veg	15	50.00	10	33.33
Mixed	15	50.00	20	66.67
Occupation				
Business	4	13.33	4	13.33
Farmer	13	43.33	14	46.66
Housewife	8	26.67	8	26.67
Service	5	16.66	4	13.33

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Table 2: Percentage and frequency distribution of demographic variables.

(n=60)

Variables	**Experimental**		**Control**	
	Frequency	Percentage	Frequency	Percentage
Duration of DM				
5	6	20.00	12	40.00
6-10.	19	63.33	14	46.67
10-20	5	16.67	4	13.33
Associated Illness				
Asthma	3	10.00	0	0.00
Hypertension	14	46.67	14	46.67
No any illness	13	43.33	16	53.33
Treatment				
Oral medication	28	93.33	28	93.33
Insulin	2	6.67	2	6.67
Habits				
Tobacco chewing	3	10.00	3	10.00
Smoking	4	13.33	5	16.67
No any habits	23	76.67	22	73.33

In the study the frequency and percentage distribution of demographic variables shows that maximum patient in experimental group 43.33% patients were in the age category of 51-60 years of age, 36.67% in the 61-70 and 20% in the 71-80 years of age. In the Control group according to age, 46.67% patients were in the age category of 51-60 years of age, 33.33% in the 61-70 and 20% in the 71-80 years of age. In experimental group, 73.33% were male patients and 26.67% were female patients. In control group 73.33% were male patients and 26.67% were female patients. Maximum patientsin experimental group 43.33% were farmers and 26.67% were housewives. In control group maximum patients 36.66% were farmers and 23.33% were housewives.

Table 3: Wound assessment in Experimental and control group before intervention.

(n=60)

Pre assessment score	GROUP			
	Experimental		**Control**	
	N	**%**	**N**	**%**
Good (31-40)	0	0	0	0
Moderate (21-30)	30	100	30	100
Poor (9-20)	0	0	0	0

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Table-3shows that all the patients selected for the study were having moderate wound healing in pre-test

Table 4: Wound assessment in experimental group after intervention.

(n=60)

Post Test		Experimental	
Healing	Score	Frequency	Percentage
Good	31-40	18	60.00
Moderate	21-30	12	40.00
Poor	9-20.	0	0.00

Table-4 shows that after interventionin experimental group, 60% of the patients has moved from moderate wound healing to good wound healing level.

Table 5: Comparison of wound assessment scores between experimental and control group.

Group	Day-1					Day-15				
	Frequency	Mean	SD	t value	P value	Frequency	Mean	SD	t value	p value
Experimental	30	22.9	0.93	1.68	0.098	30	31.20	1.32	5.94	0.000
Control	30	23.3	1.06			30	28.87	1.70		

The above table shows thatthe pre-test and post-test comparison of wound healing in experimental and control group. The comparisons of the pre-test wound healing average scores of experimental and control groups was done by using unpaired t test. The pre-test average score of experimental group was 22.9 with standard deviation of 0.93 and the pre-test average score of control group was 23.3 with standard deviation of 1.06.The test statistics value of the unpaired t test was 1.68 with p value 0.098. Here p value more than 0.05, shows no significant difference in the wound healing average scores.

The post-test on an average score of experimental group was 31.20 with standard deviation of 1.32. The post-test average score of control group was 28.87 with standard deviation of 1.70. The test statistics value of the unpaired t test was 5.94 with p value 0.000. Here p value is less than 0.05, hence the study shows that significant difference in the wound healing average scores.

IV DISCUSSION

In the study the frequency and percentage distribution of demographic variables shows that maximum patient in experimental group 43.33% patients were in the age category of 51-60 years of age, 36.67% in the 61-70 and 20% in the 71-80 years of age. In the Control group according to age, 46.67% patients were in the age category of 51-60 years of age, 33.33% in the 61-70 and 20% in the 71-80 years of age. Similar study conducted by, Jemcy John1 and A.Rathiga.[6] Diabetic foot ulcer Patients of Maximum in experimental group, 73.33% were male patients and 26.67% were female patients. In control group 73.33% were male patients and 26.67% were female patients. Similar study conducted by, Anju Kumari1, Kanika Rai2, Vinay Kumari3, Dr. (Mrs) Jyoti Sarin4,[7].Maximum patients in experimental group 50% were taking veg diet and 50% mixed diet. In control group 33.33% were taking veg diet and 66.67% mixed diet. Similar study conducted by Hemalatha K.[8].Maximum patientsin experimental group 43.33% were farmers and 26.67% were housewives. In control group maximum patients of 36.66% were farmers and 23.33% were housewives. Similar study conducted by Hassan ZM, EL-Din SA, ElRasek A.[9]. Andmaximum patients 93.33% were taking oral medications, and 6.67% taking Insulin. IN the control group 93.33% were taking oral medications, and 6.67% taking Insulin.

The study shows that there was significant difference in wound healing after intervention in experimental group on pre assessment and day 8th and day 15thtest statistics value of the unpaired t test was 5.94 with p value 0.000. Here p value less than 0.05, shows significant difference in the wound healing average scores.

The Buerger Allen Exercise improves wound healing in diabetic foot ulcer patients is supported by many research studies such as “an experimental study conducted by M.Vijayabarathi, and V.Hemavathy, intended tofind out the effect of Buerger Allen exercise on wound healing process of diabetic foot ulcer patient., Sixty patients with a diabetic foot ulcer where selected by using Non probability purposive sampling technique and grouped into two group. (Experimental group 30 and Control group 30). Study finding revealed that on an average, in experimental group, diabetic patients are 24.6 % improved wound

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healing where as in control group, on an average, diabetic patients are having only 5.3 % wound healing. The study was found to be effective in experimental group on wound healing process among type 2 diabetic patients. [5]

This study shows that after intervention there is significant difference between the pre and post assessment score of wound healing among diabetic foot ulcer patients in Experimental group.

V CONCLUSION

The following conclusion was drawn from the above study. The diabetic patient with foot ulcer in the experimental group had improved wound healing of the foot ulcer. So in addition to the pharmacological treatment Buerger Allen exercise can be used as an effective complimentary treatment modality for managing diabetic foot ulcer. The future of this field of nursing science promised to be one of the rapid significant growths, the results of which will directly influence patient care in the aspect of promoting wound healing as that of "evidence based nursing care".

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